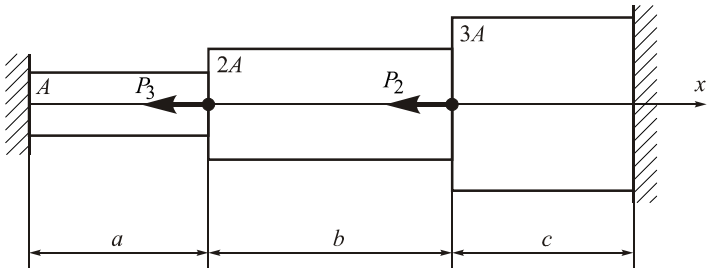
National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 1 **Complexity: 1**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 30$kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

Mark: **Mark:**

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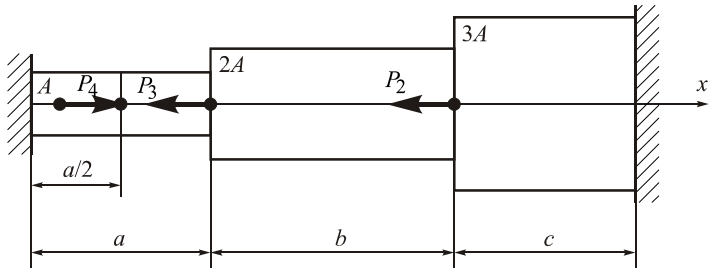
Variant: 2 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 20$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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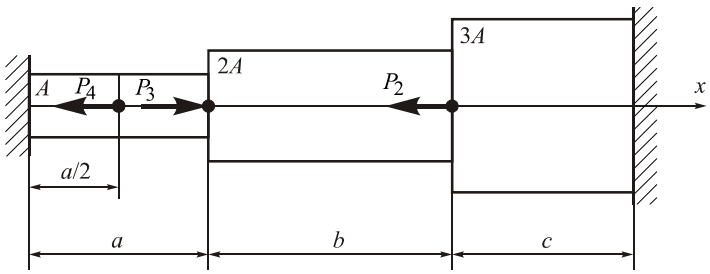
Variant: 3 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 30$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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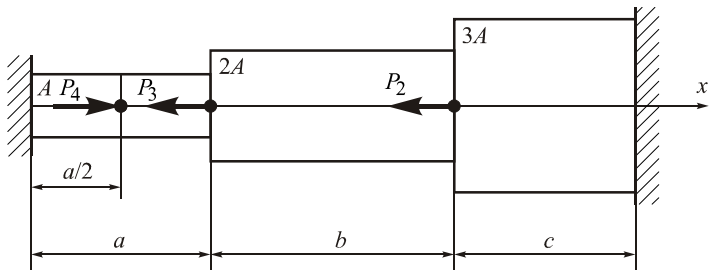
Variant: 4 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 40$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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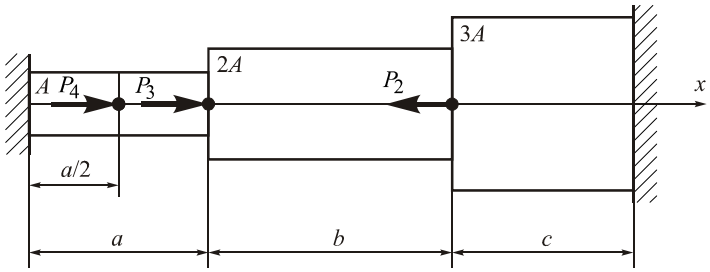
Variant: 5 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 30$ kN; $P_4 = 60$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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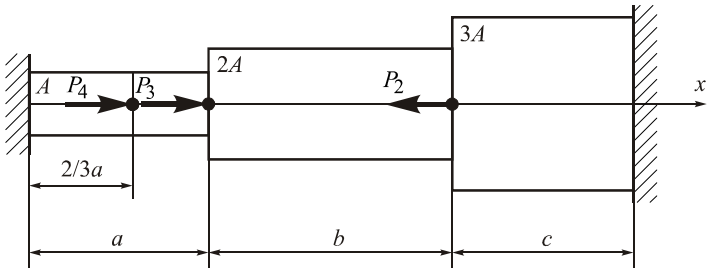
Variant: 6 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 40$ kN; $P_4 = 60$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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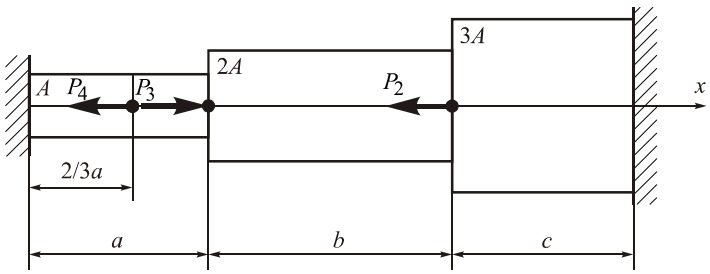
Variant: 7 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 50$ kN; $P_4 = 60$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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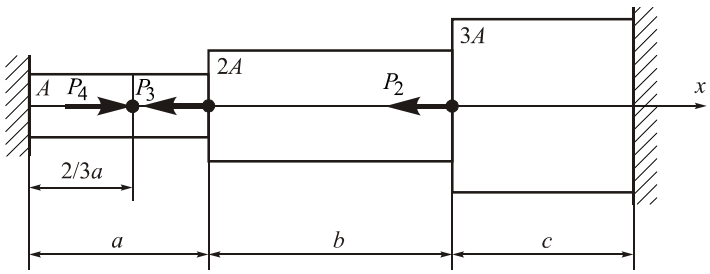
Variant: 8 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 30$ kN; $P_4 = 70$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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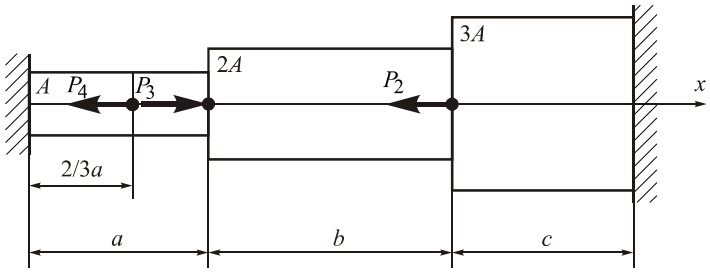
Variant: 9 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 40$ kN; $P_4 = 70$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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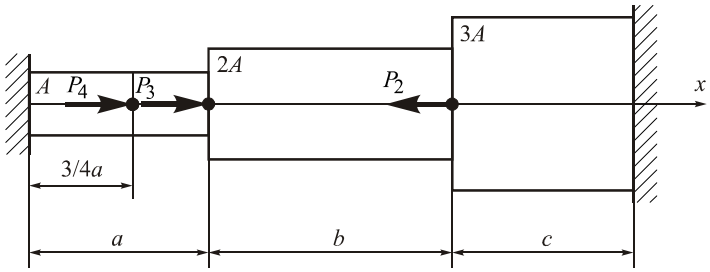
Variant: 10 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 50$ kN; $P_4 = 70$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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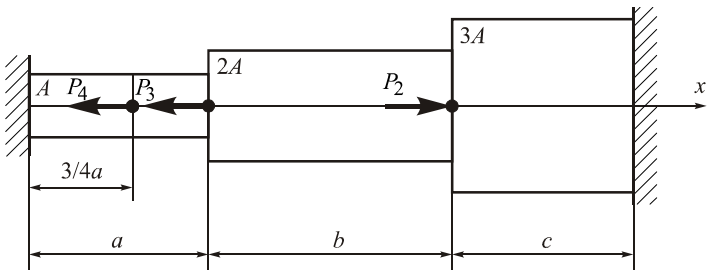
Variant: 11 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 60$ kN; $P_4 = 70$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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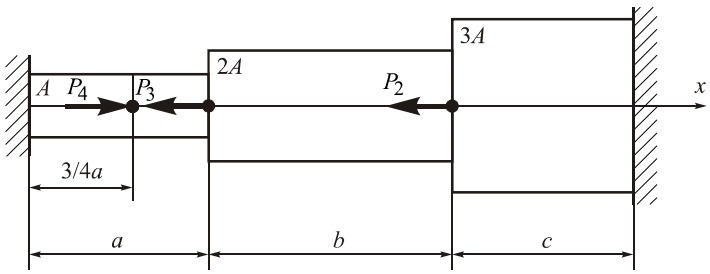
Variant: 12 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 30$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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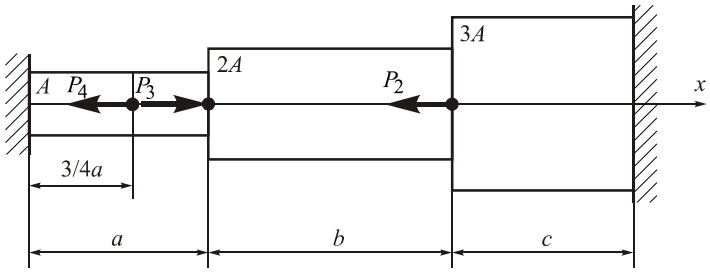
Variant: 13 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 40$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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Topic: Stresses and elongations in statically indeterminate rods in tension-compression
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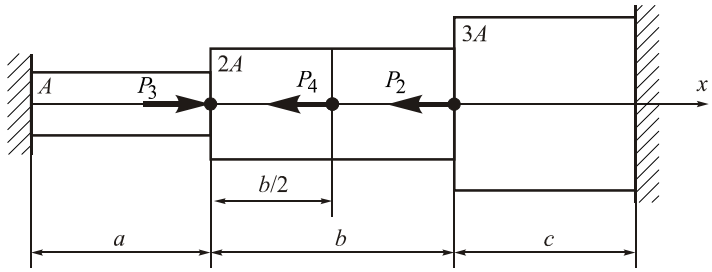
Variant: 14 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 50$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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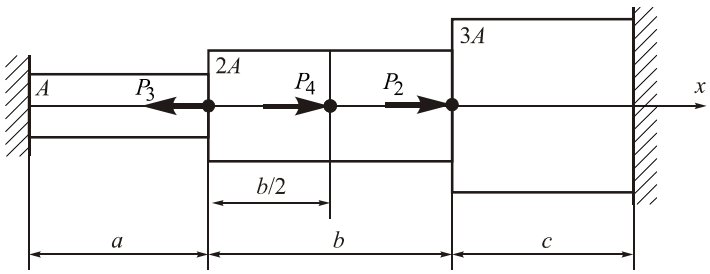
Variant: 15 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 60$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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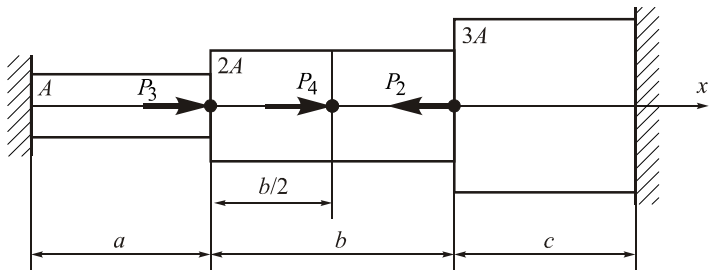
Variant: 16 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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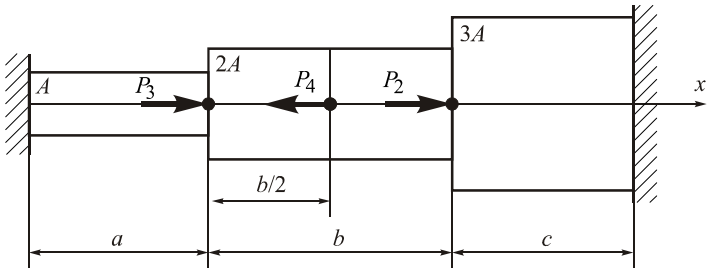
Variant: 17 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 50$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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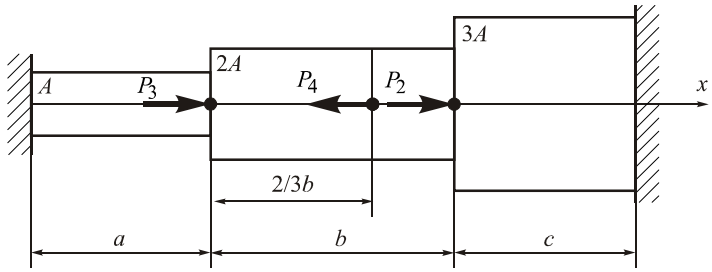
Variant: 18 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 60$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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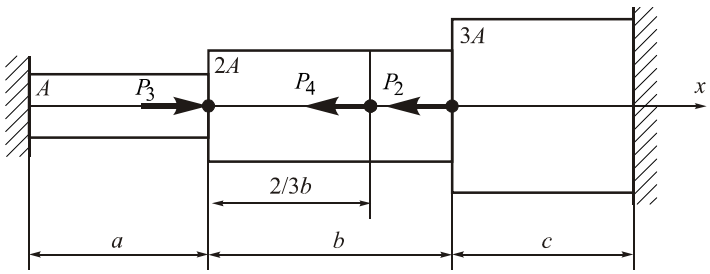
Variant: 19 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 40$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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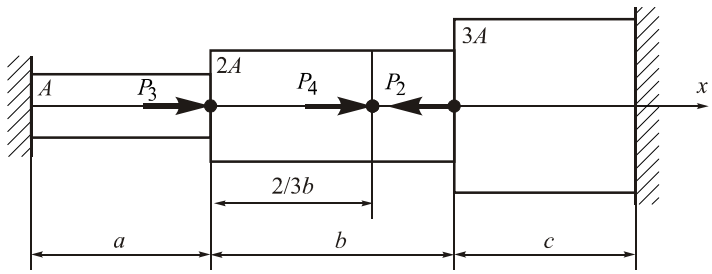
Variant: 20 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 50$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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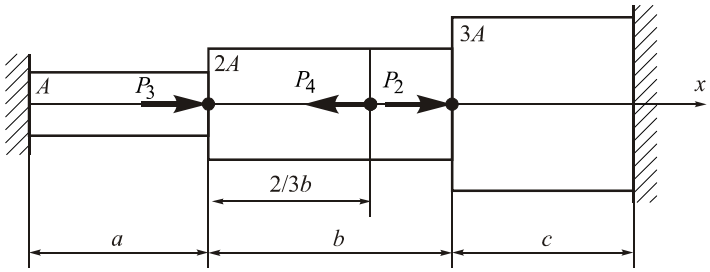
Variant: 21 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 60$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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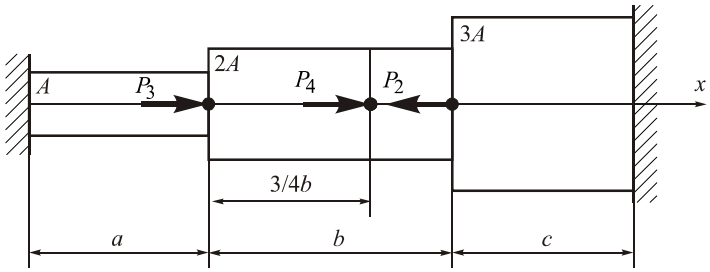
Full name of the student, group

Variant: 22 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 40$ kN; $P_3 = 50$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

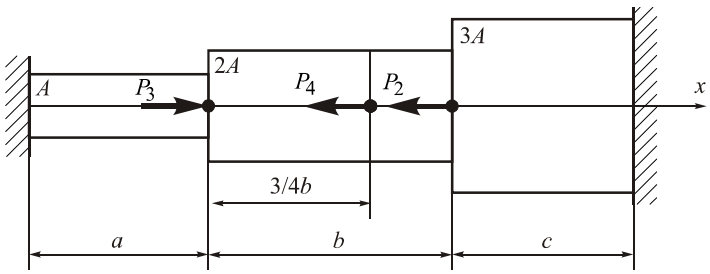
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 23 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 40$ kN; $P_3 = 60$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

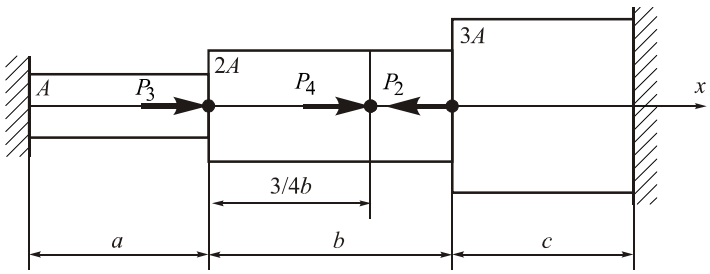
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 24 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 40$ kN; $P_3 = 70$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

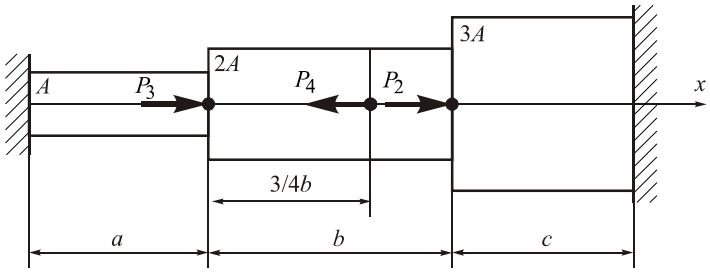
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 25 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 50$ kN; $P_3 = 60$ kN; $P_4 = 90$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

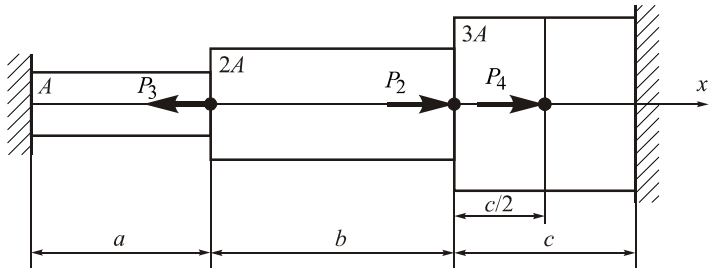
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 26 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 40$ kN; $P_4 = 90$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

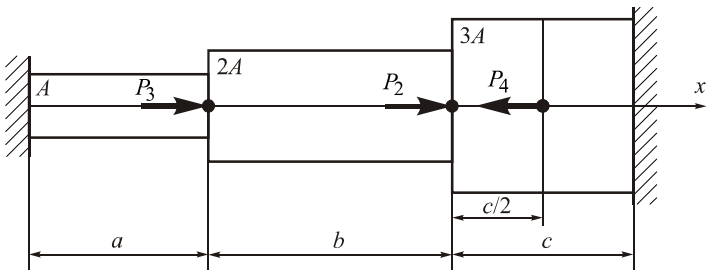
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 27 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 2$ kN; $P_3 = 50$ kN; $P_4 = 90$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

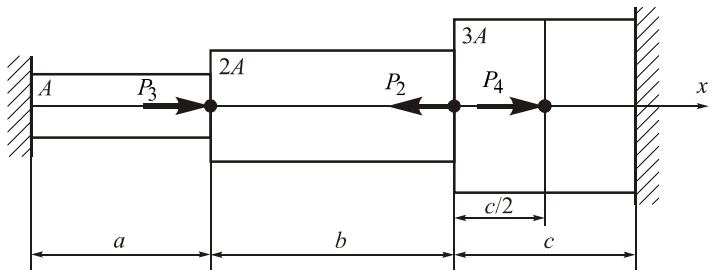
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 28 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 30$ kN; $P_4 = 90$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

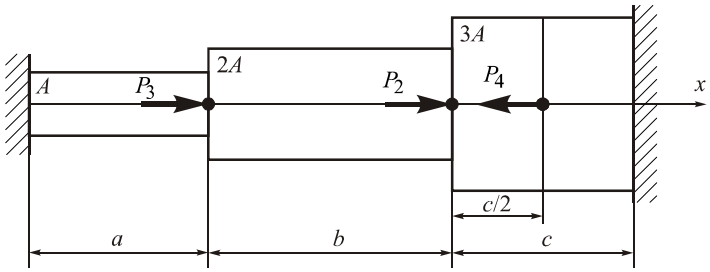
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 29 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 30$ kN; $P_4 = 60$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

Mark: **Mark:**

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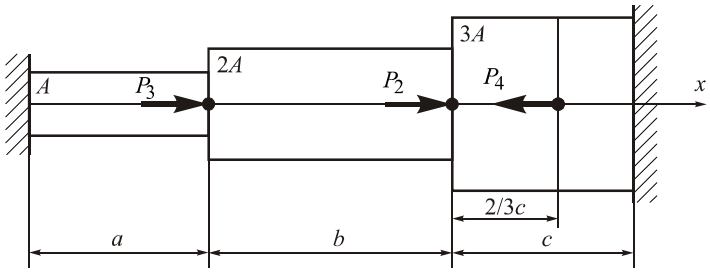
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 30 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 60$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

Mark: **Mark:**

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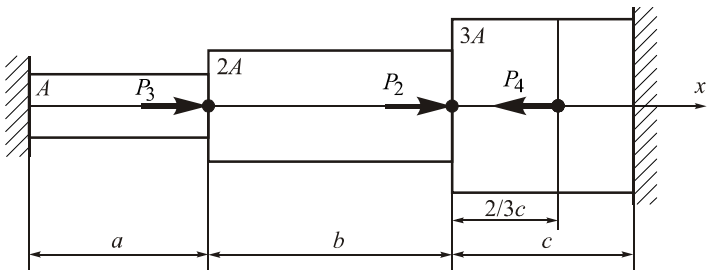
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 31 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

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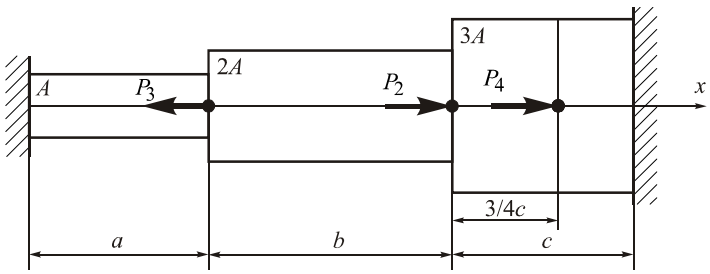
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 32 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 60$ kN; $P_4 = 90$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

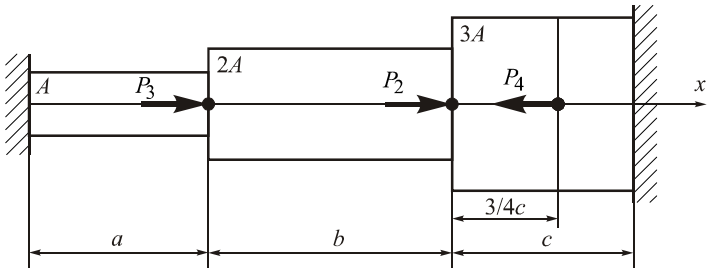
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 33 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 20$ kN; $P_4 = 30$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

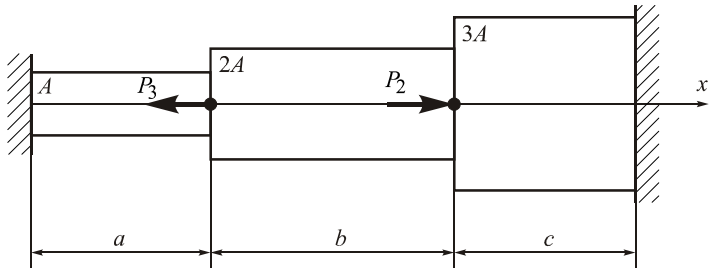
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 34 **Complexity: 1**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 40$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

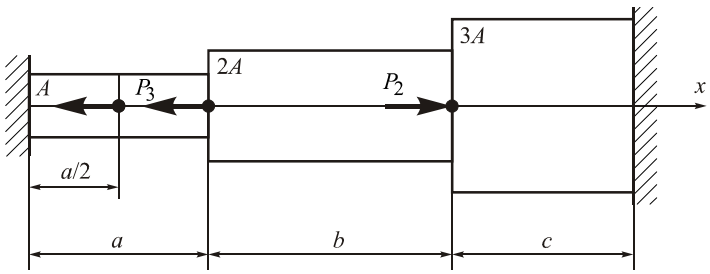
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 35 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 40$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

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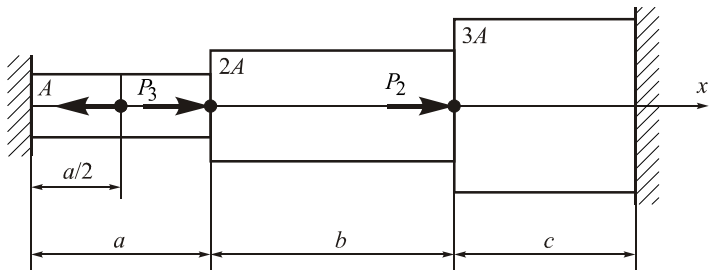
National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 36 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 40$ kN; $P_3 = 60$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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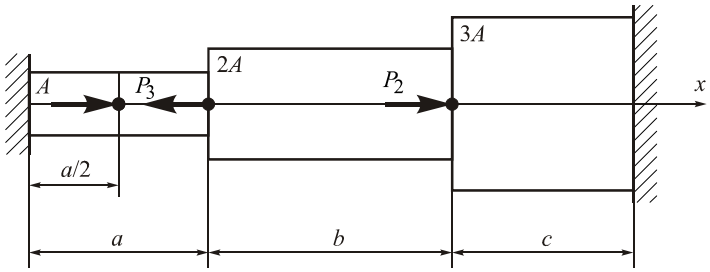
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 37 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 90$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

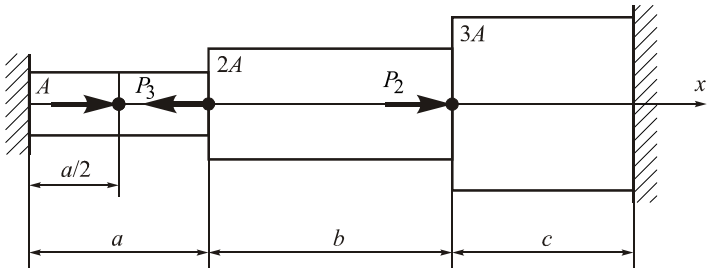
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 38 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 40$ kN; $P_3 = 60$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

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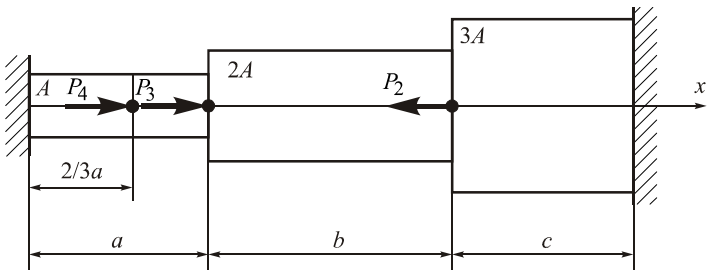
National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 39 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 50$ kN; $P_3 = 40$ kN; $P_4 = 90$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

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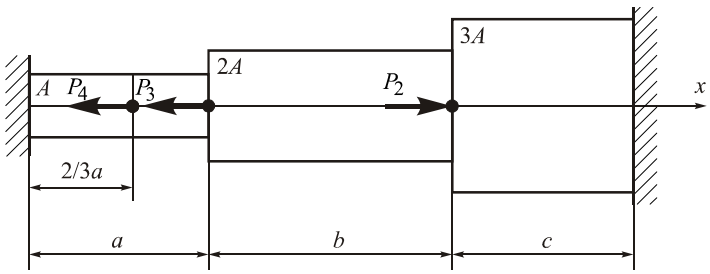
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 40 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 30$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

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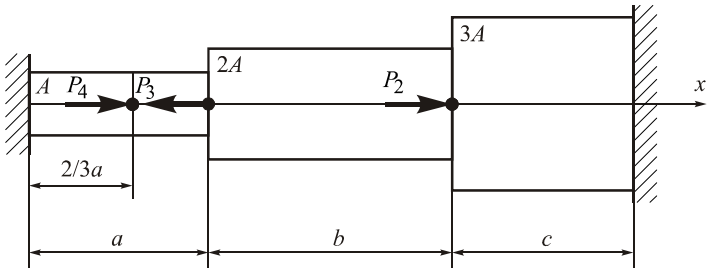
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 41 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 50$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

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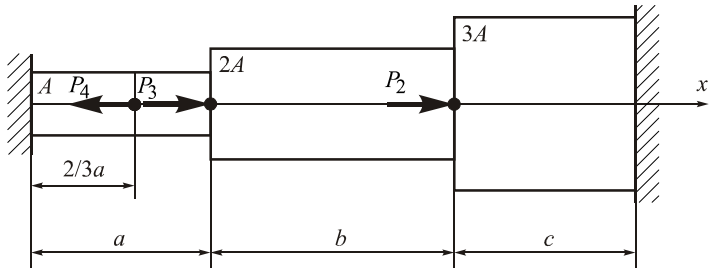
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 42 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 40$ kN; $P_4 = 90$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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Subject: mechanics of materials
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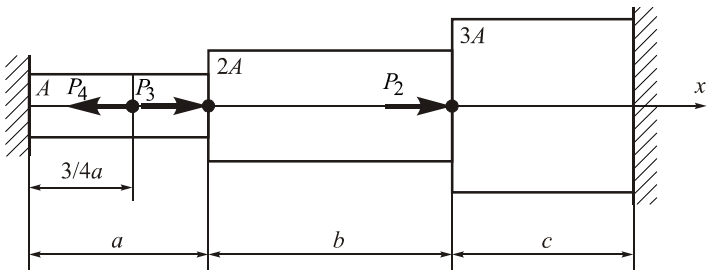
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 43 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 40$ kN; $P_4 = 60$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

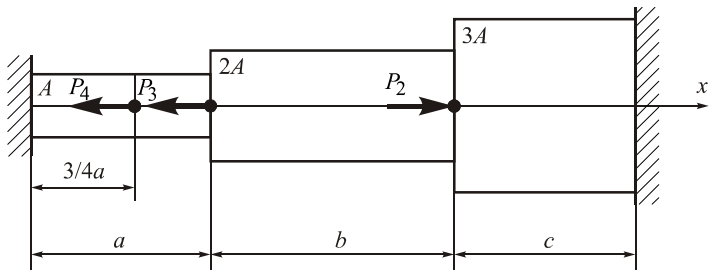
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 44 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 50$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

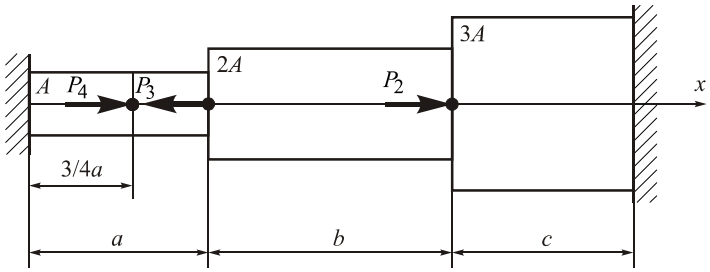
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 45 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 60$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

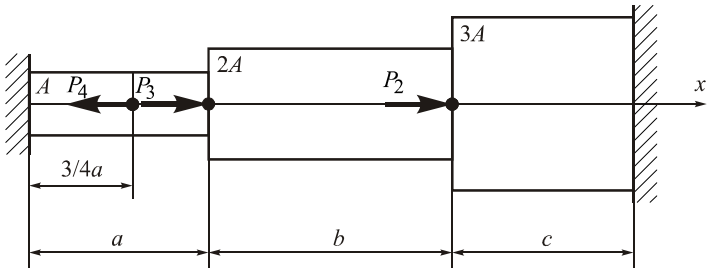
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 46 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 50$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

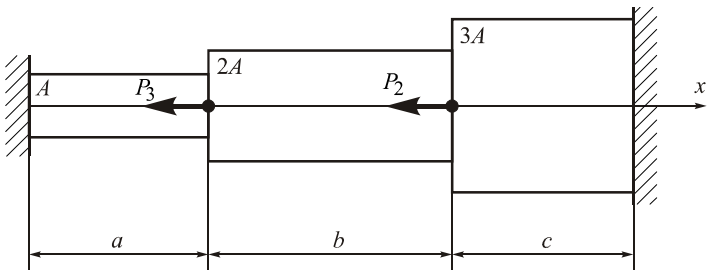
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 47 **Complexity: 1**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

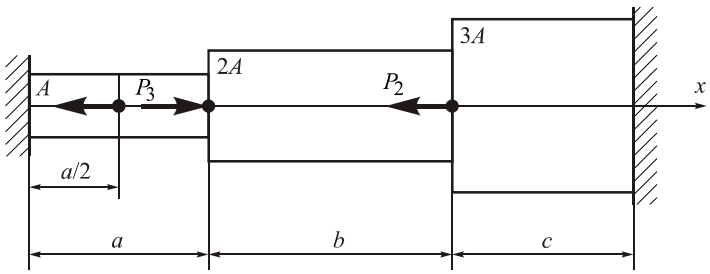
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 48 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 30$ kN; $P_4 = 40$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

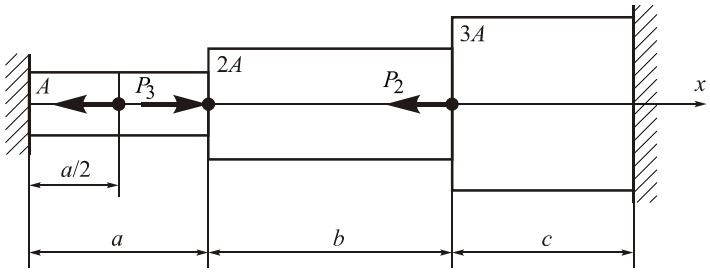
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 49 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 20$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

Mark: **Mark:**

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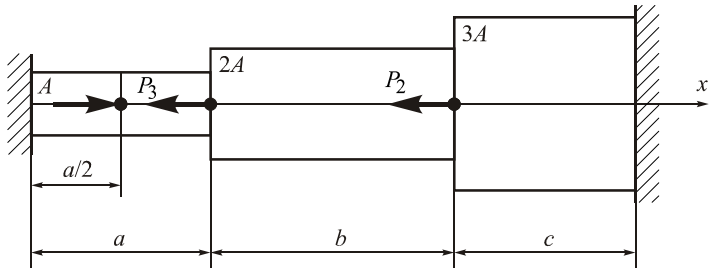
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 50 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 60$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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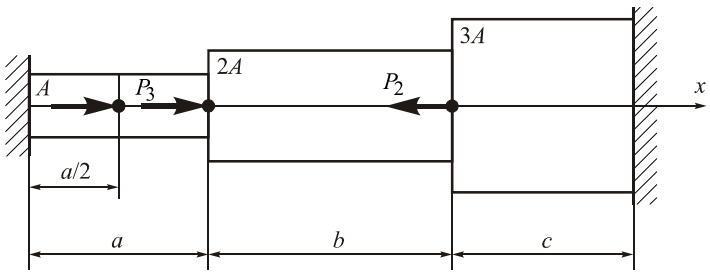
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 51 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 90$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

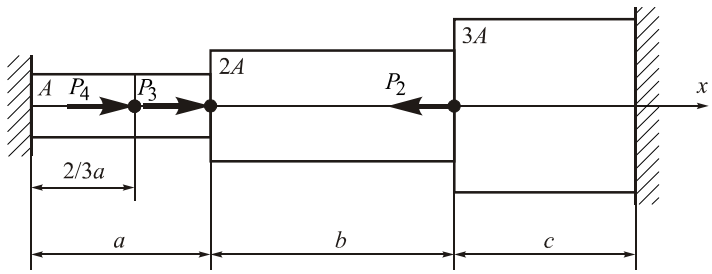
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 52 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 40$ kN; $P_3 = 50$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

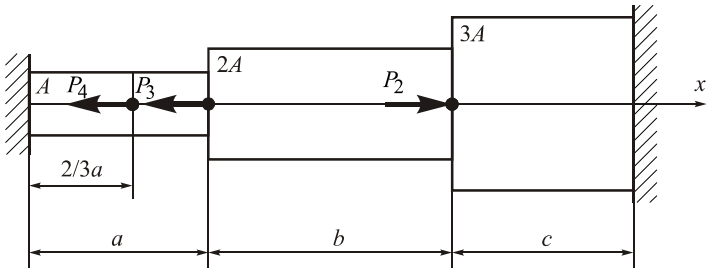
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 53 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

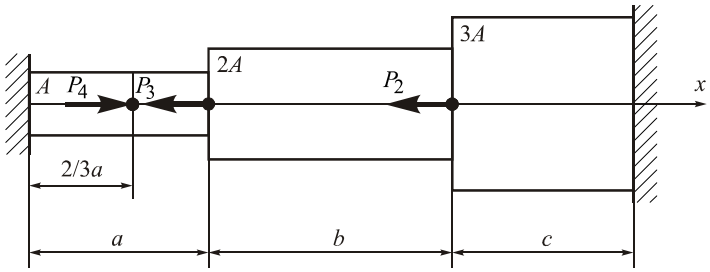
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 54 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

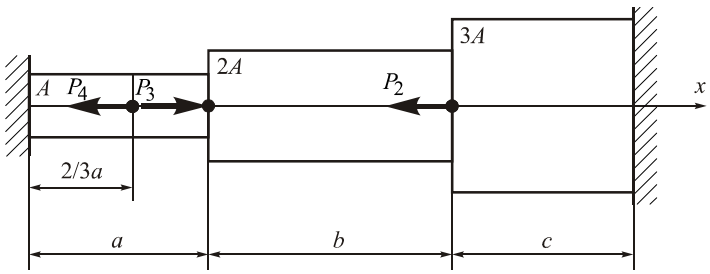
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 55 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 40$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

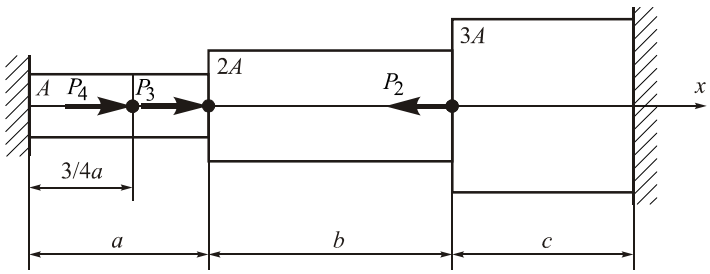
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 56 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 90$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

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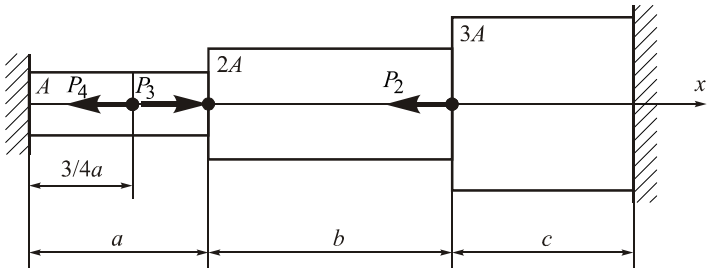
National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 57 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 60$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

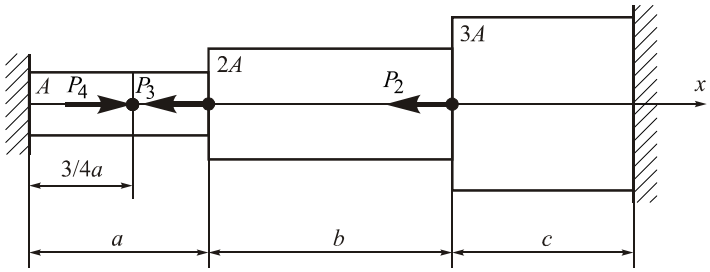
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 58 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 50$ kN; $P_3 = 70$ kN; $P_4 = 90$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

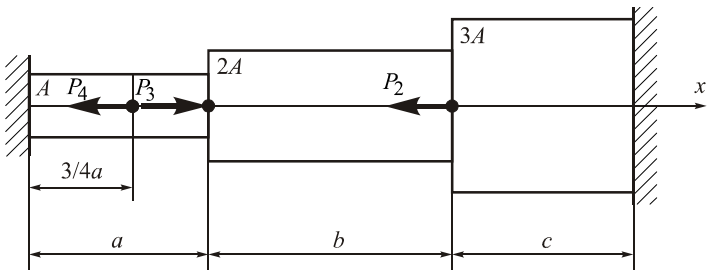
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 59 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 40$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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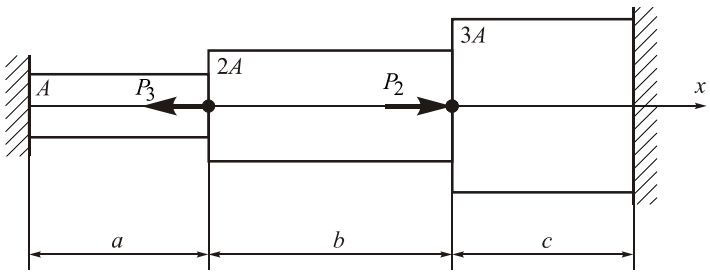
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 60 **Complexity: 1**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

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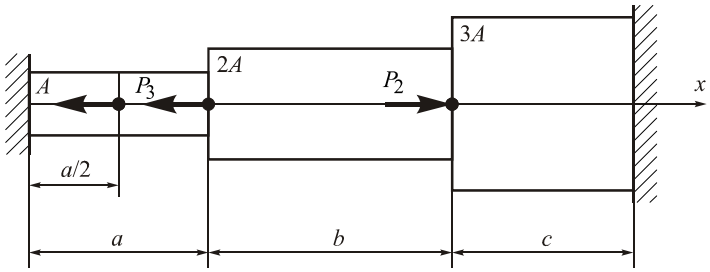
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 61 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 50$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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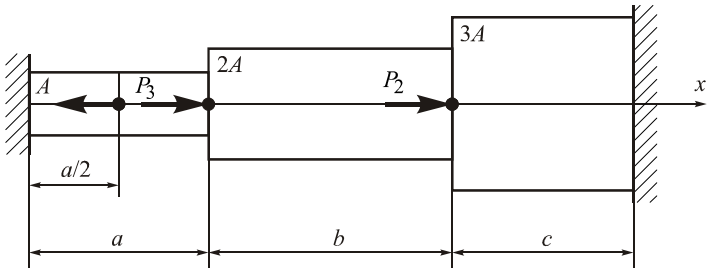
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 62 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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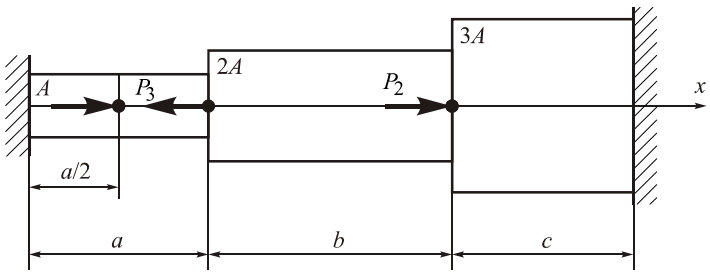
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 63 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 40$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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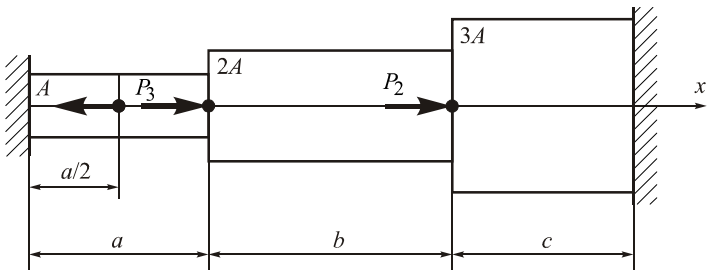
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 64 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 50$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

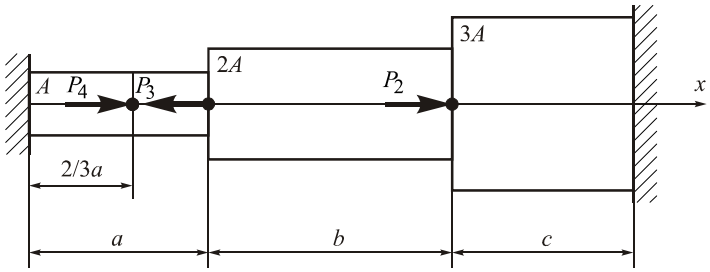
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 65 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 40$ kN; $P_3 = 60$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
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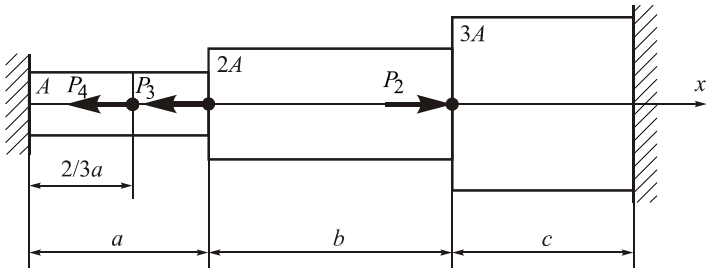
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 66 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 30$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

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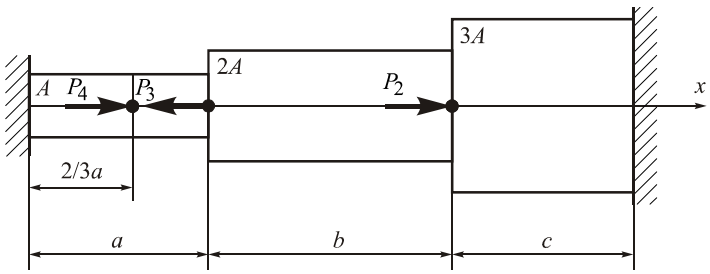
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 67 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 90$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
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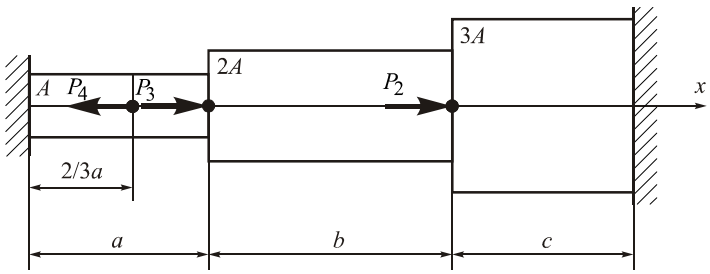
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 68 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 60$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
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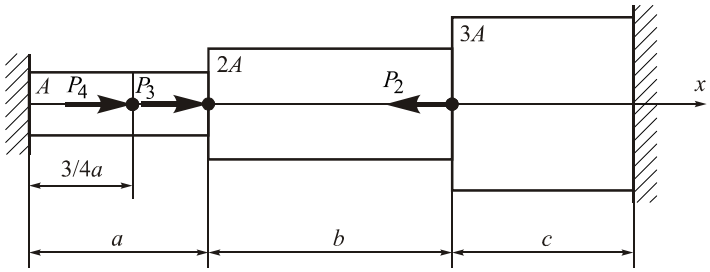
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 69 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 50$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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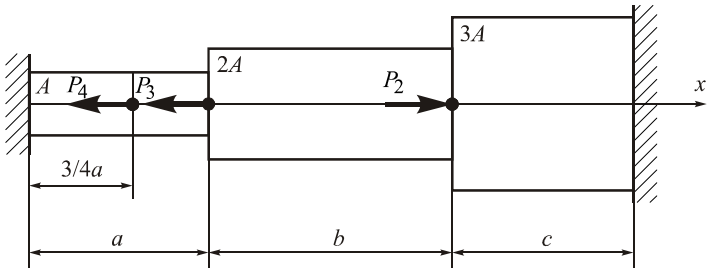
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 70 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 40$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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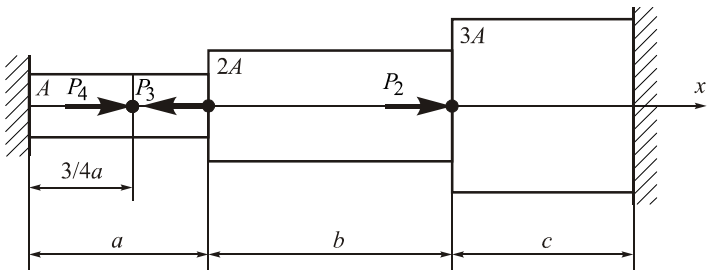
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 71 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 40$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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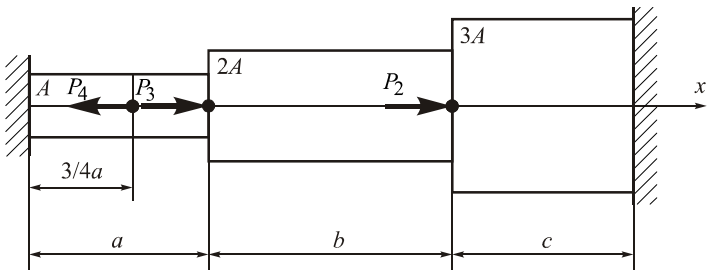
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 72 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 40$ kN; $P_3 = 70$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

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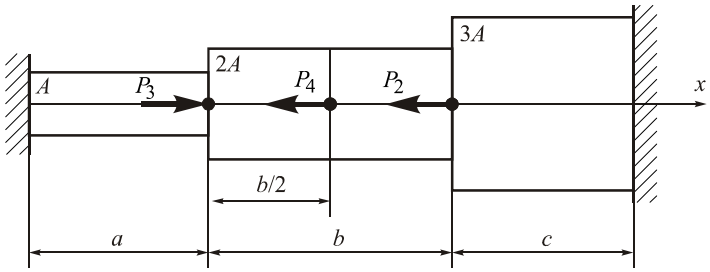
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 73 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 50$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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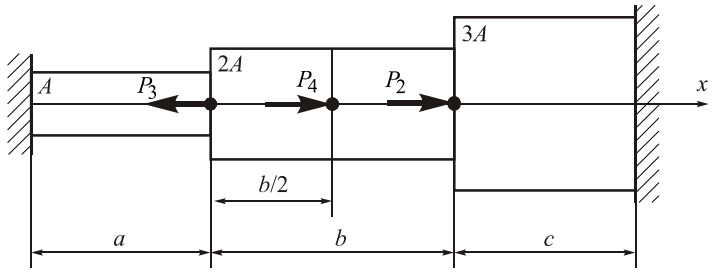
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 74 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 70$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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Mark: **Mark:**

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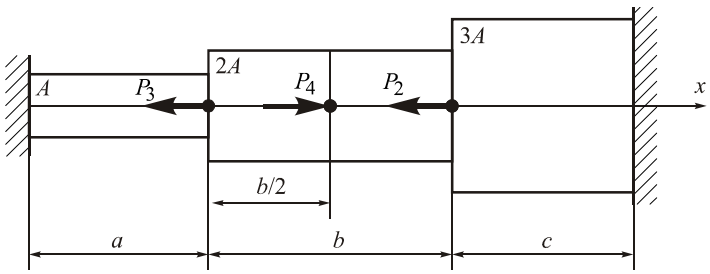
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 75 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 40$ kN; $P_4 = 70$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

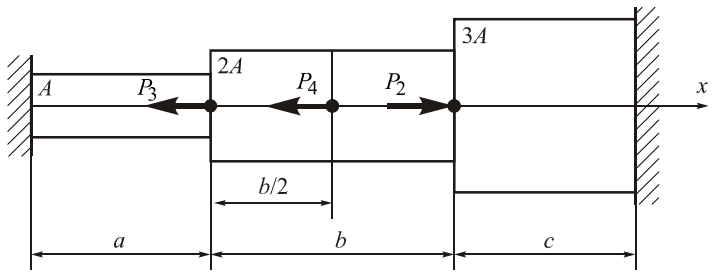
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 76 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 50$ kN; $P_4 = 70$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

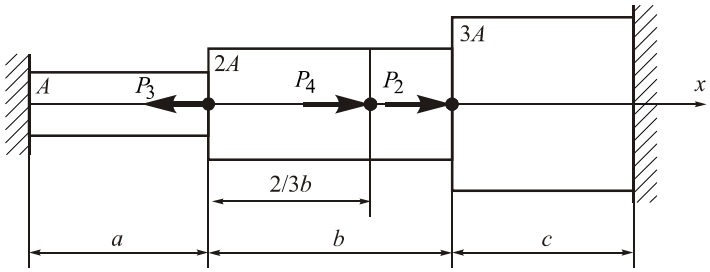
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 77 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 50$ kN; $P_3 = 60$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

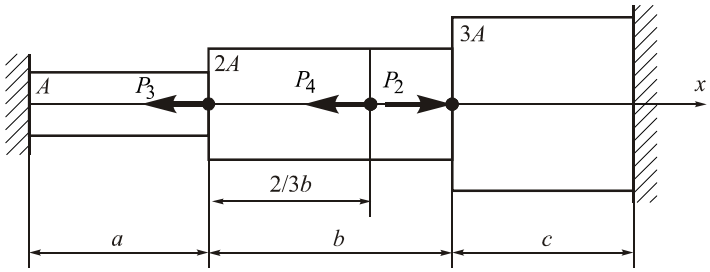
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 78 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 30$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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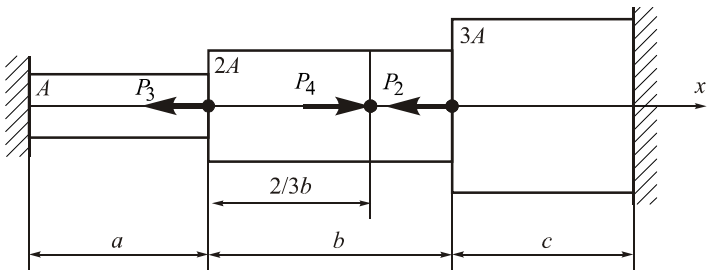
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 79 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 40$ kN; $P_4 = 60$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

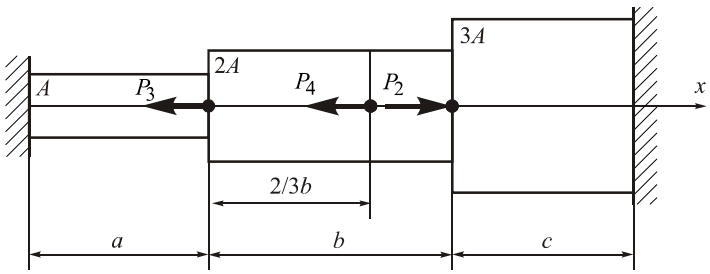
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 80 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 50$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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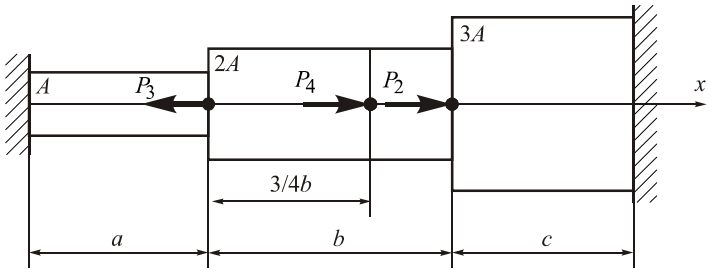
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 81 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 30$ kN; $P_4 = 70$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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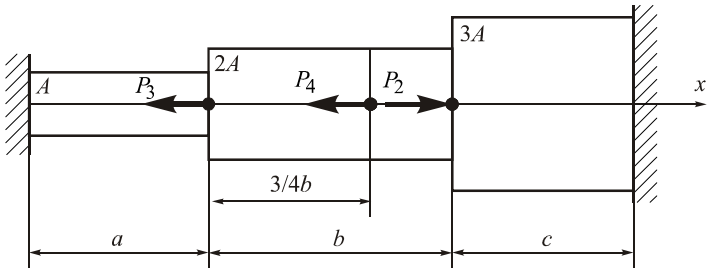
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 82 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 60$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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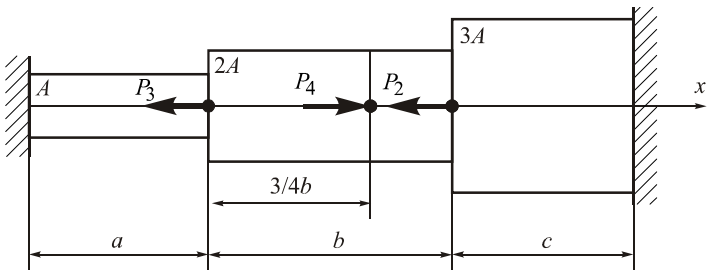
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 83 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 20$ kN; $P_4 = 40$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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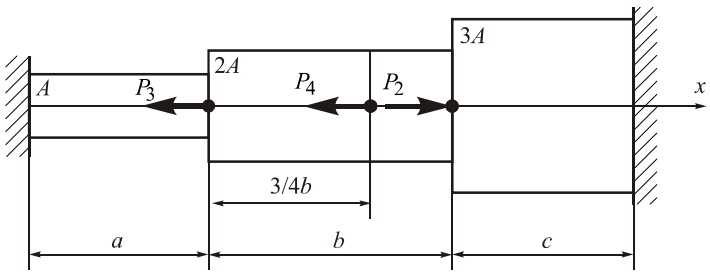
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 84 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 30$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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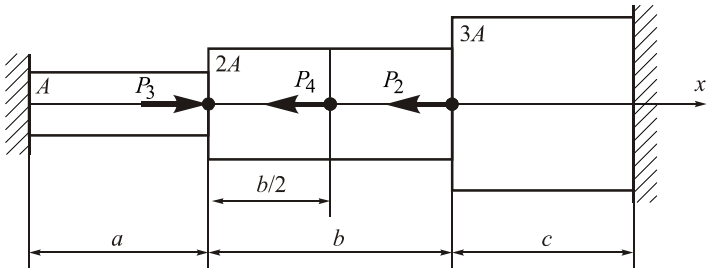
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 85 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

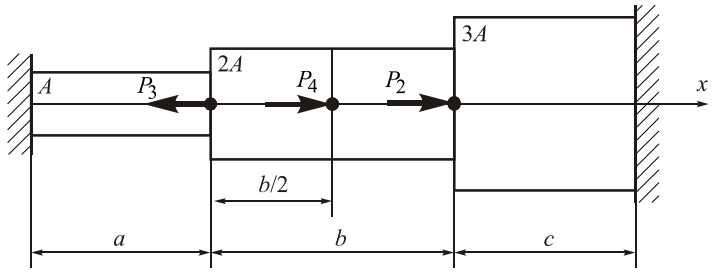
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 86 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 40$ kN; $P_4 = 70$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

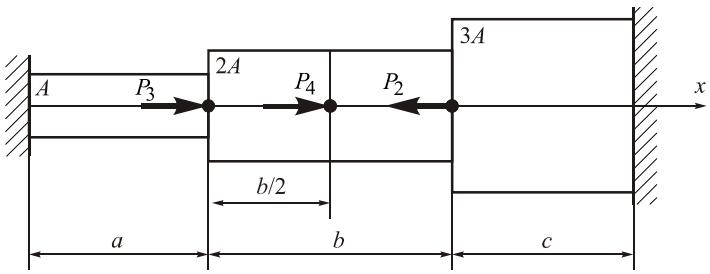
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 87 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 30$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

Mark: **Mark:**

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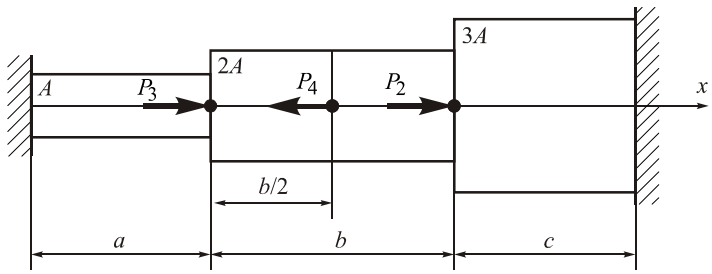
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 88 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 60$ kN; $P_3 = 70$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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Mark: **Mark:**

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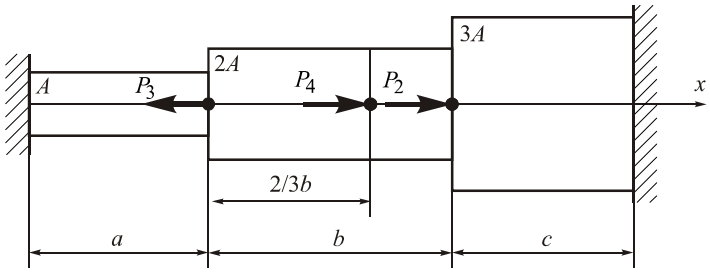
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 89 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 50$ kN; $P_3 = 70$ kN; $P_4 = 90$ kN.
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

Mark: **Mark:**

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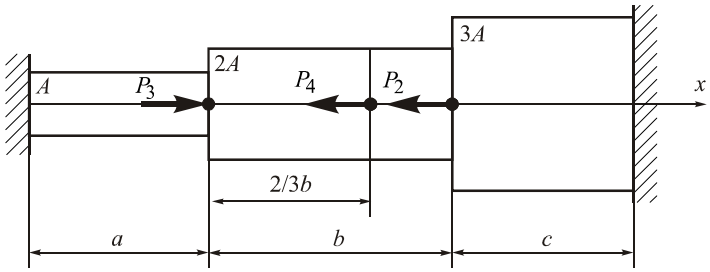
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 90 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 40$ kN; $P_3 = 60$ kN; $P_4 = 90$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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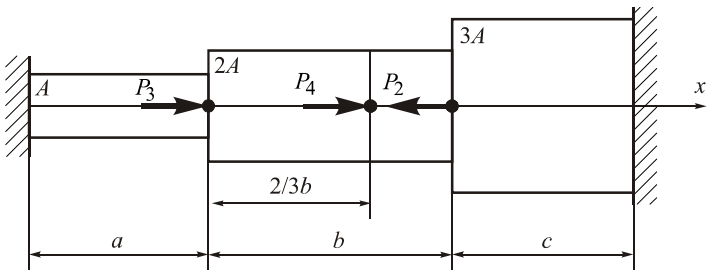
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 91 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 50$ kN; $P_3 = 70$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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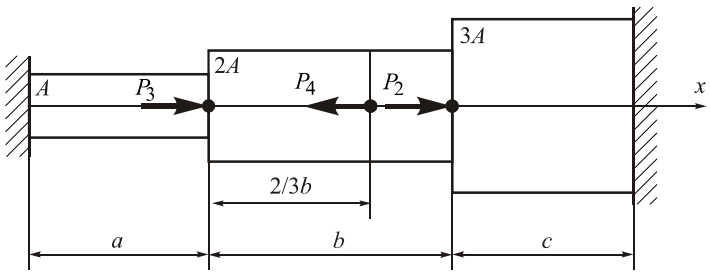
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 92 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 40$ kN; $P_3 = 70$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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Subject: mechanics of materials
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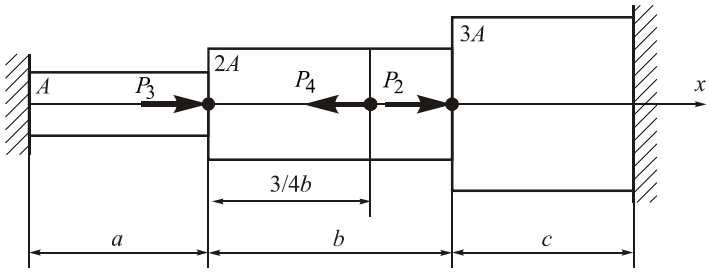
Full name of the student, group

Variant: 93 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 50$ kN; $P_3 = 60$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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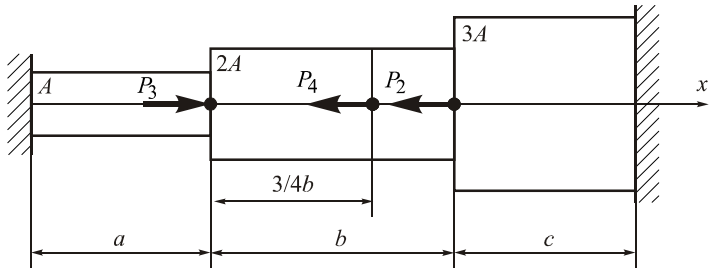
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 94 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 40$ kN; $P_4 = 70$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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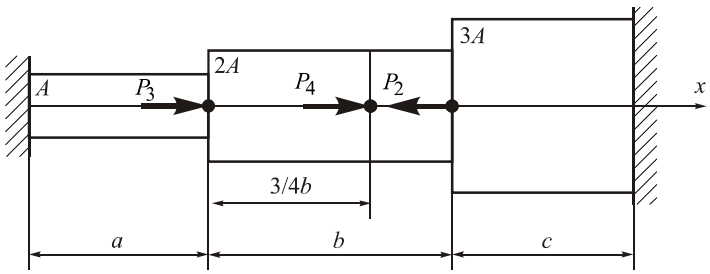
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 95 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 50$ kN; $P_4 = 90$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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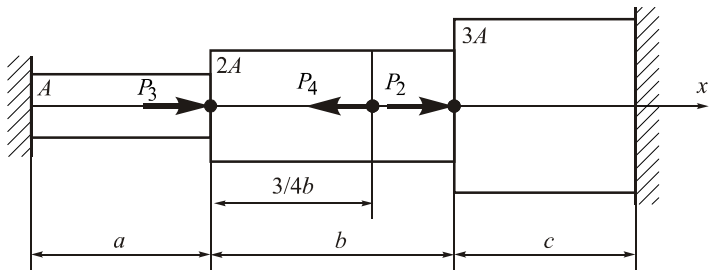
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 96 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 50$ kN; $P_3 = 70$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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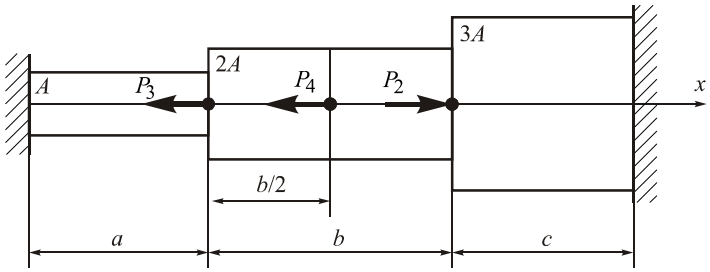
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 97 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 30$ kN; $P_4 = 40$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

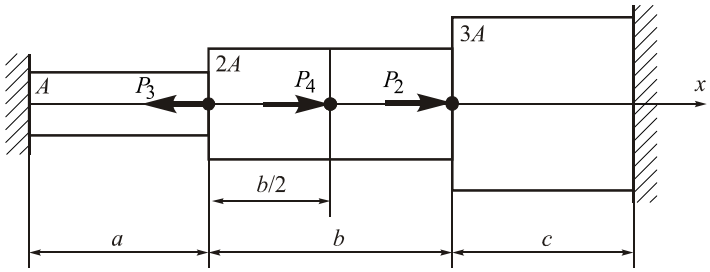
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 98 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 50$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

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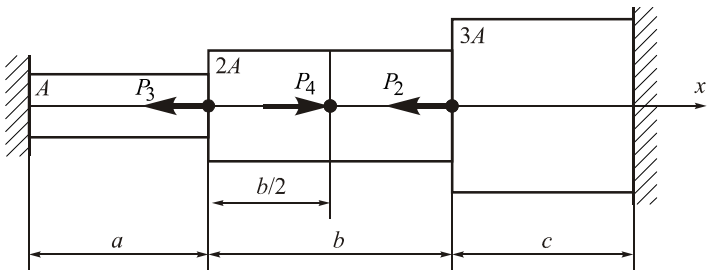
National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 99 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 50$ kN; $P_3 = 60$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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Subject: mechanics of materials
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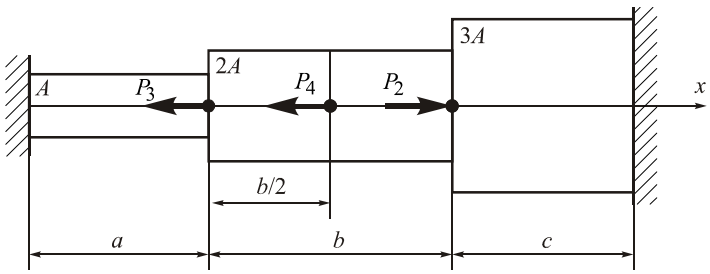
Full name of the student, group

Variant: 100 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 40$ kN; $P_4 = 60$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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"Kharkiv Aviation Institute"
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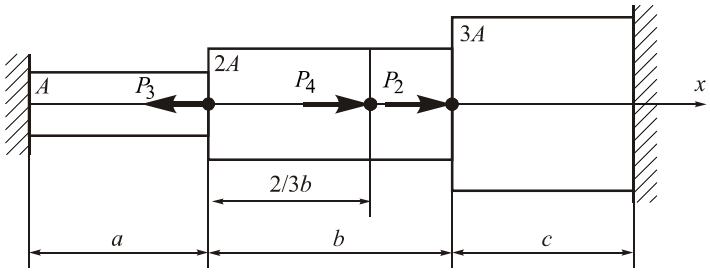
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 101 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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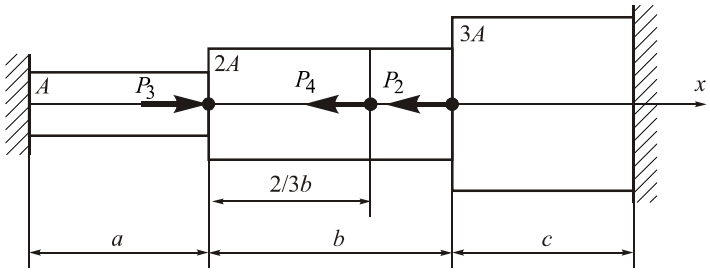
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 102 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 40$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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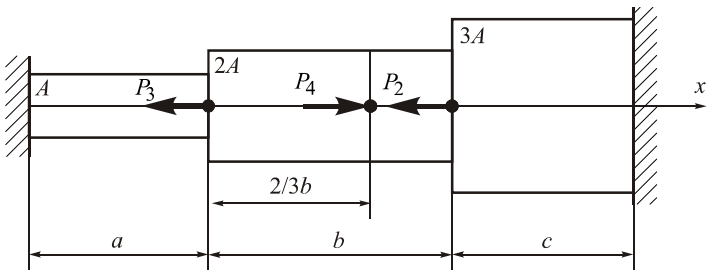
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 103 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 70$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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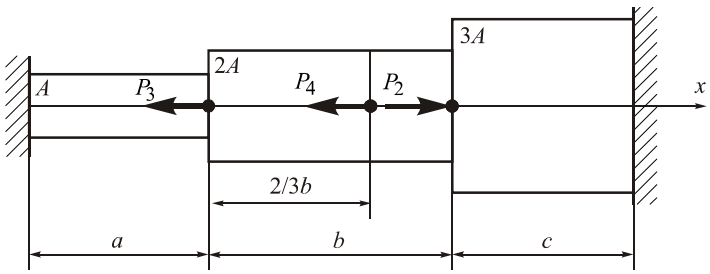
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 104 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 60$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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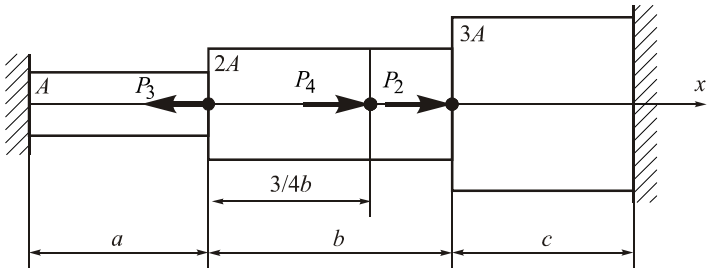
Full name of the student, group

Variant: 105 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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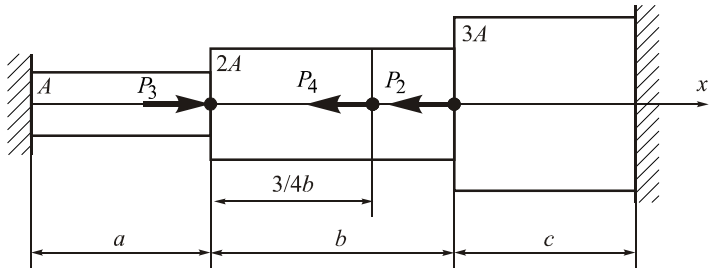
Full name of the student, group

Variant: 106 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 20$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

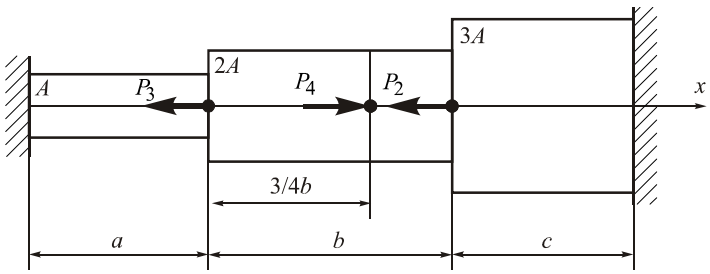
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 107 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 60$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

Mark: **Mark:**

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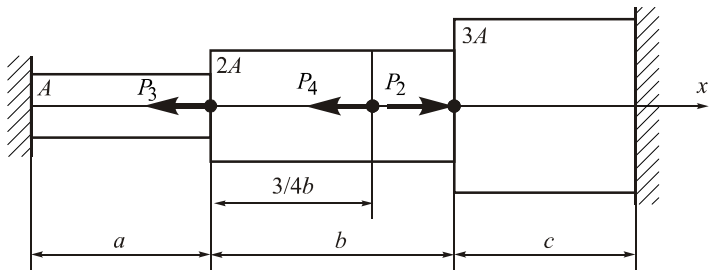
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 108 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 70$ kN; $P_3 = 80$ kN; $P_4 = 90$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

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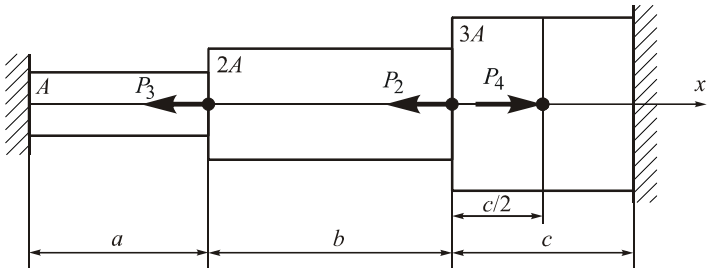
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 109 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 50$ kN; $P_3 = 70$ kN; $P_4 = 90$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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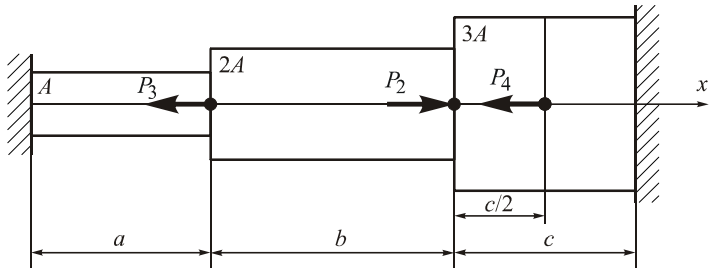
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 110 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 50$ kN; $P_4 = 90$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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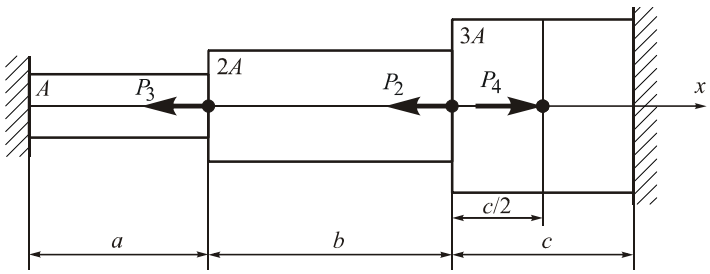
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 111 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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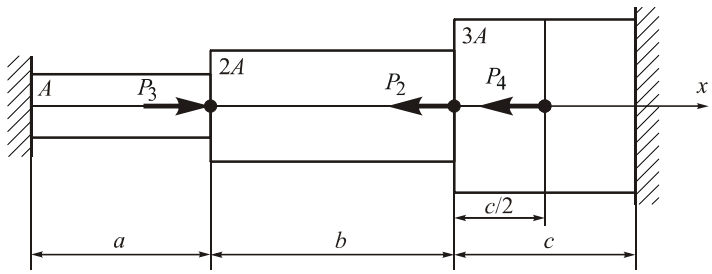
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 112 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 40$ kN; $P_4 = 60$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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Subject: mechanics of materials
Document: home problem
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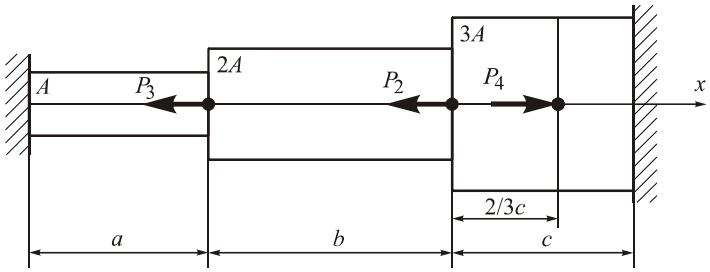
Full name of the student, group

Variant: 113 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 50$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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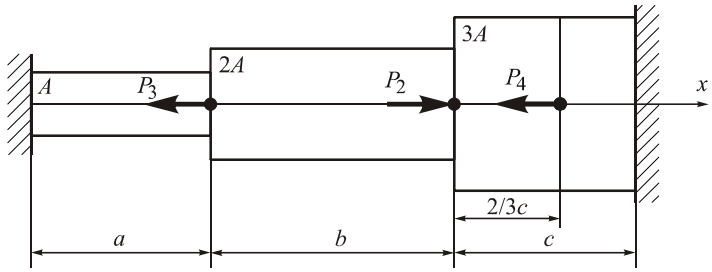
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 114 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 20$ kN; $P_4 = 40$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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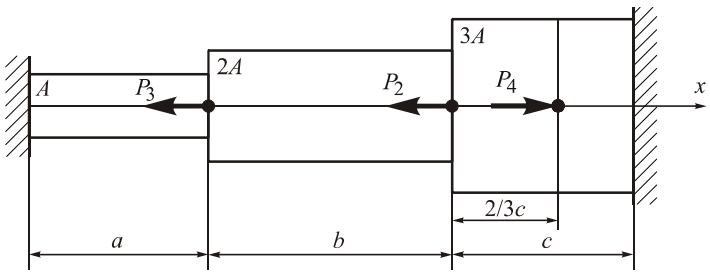
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 115 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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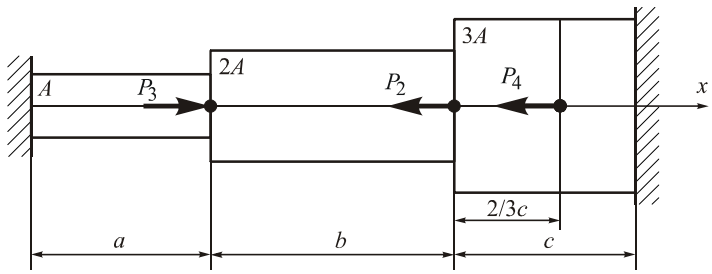
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 116 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 50$ kN; $P_4 = 90$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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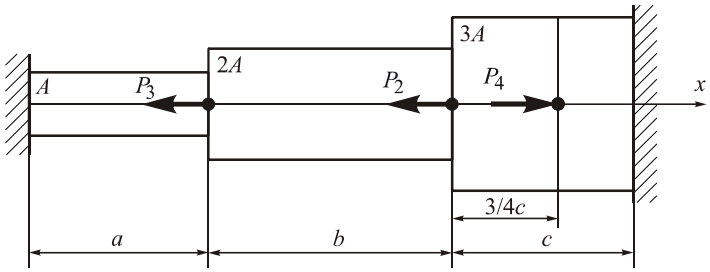
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 117 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 30$ kN; $P_4 = 60$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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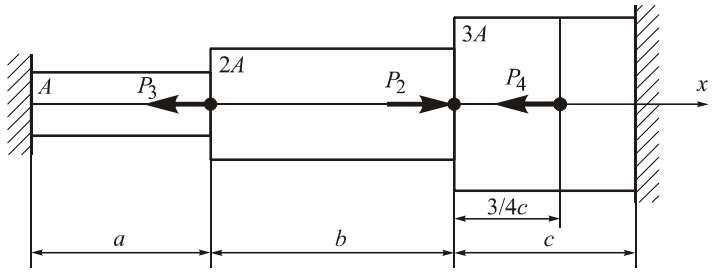
National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 118 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 60$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

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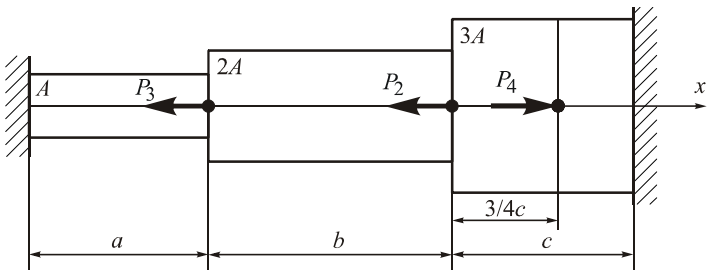
National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 119 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 50$ kN; $P_4 = 70$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

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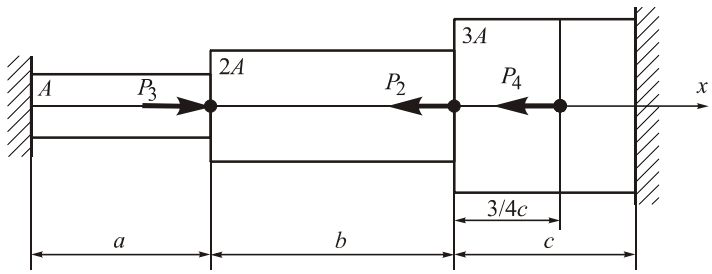
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 120 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 40$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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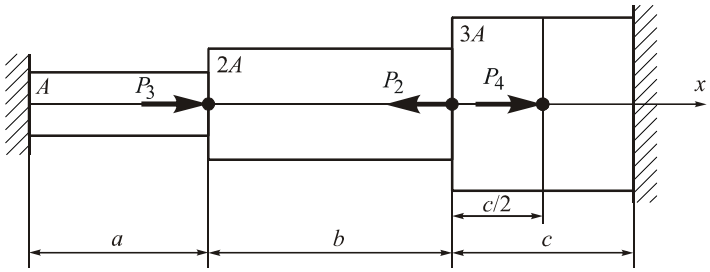
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 121 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 70$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

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Subject: mechanics of materials
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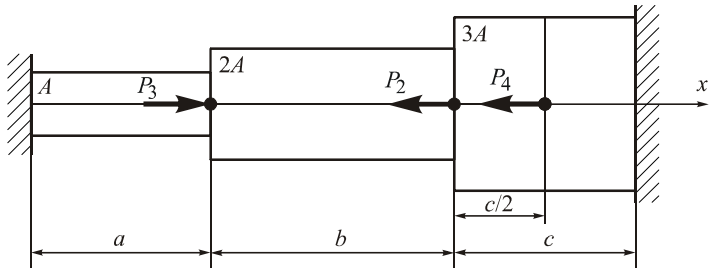
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 122 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 40$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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Subject: mechanics of materials
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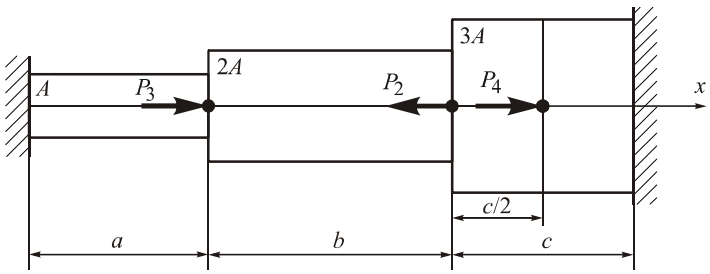
Variant: 123 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 40$ kN; $P_3 = 60$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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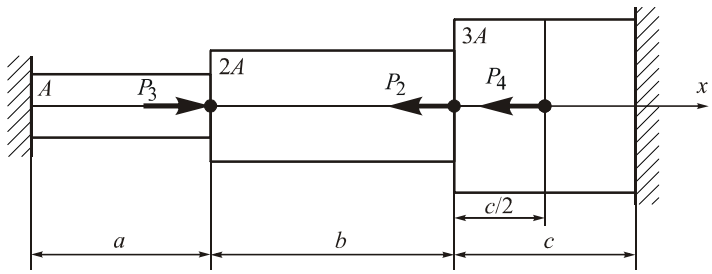
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 124 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 50$ kN; $P_3 = 70$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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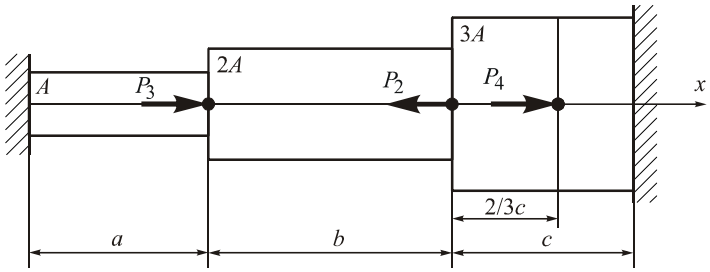
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 125 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 30$ kN; $P_4 = 60$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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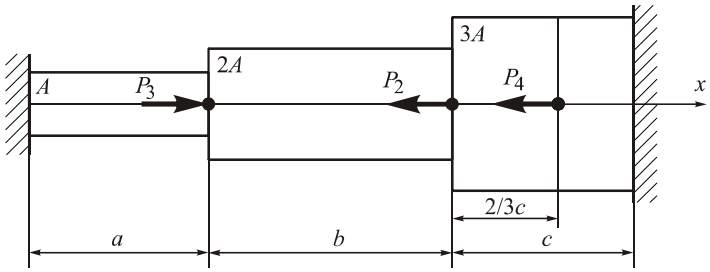
Full name of the student, group

Variant: 126 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 50$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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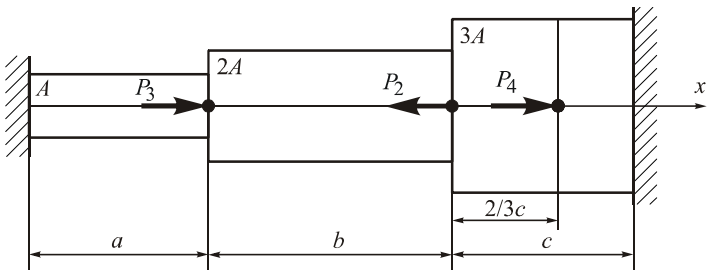
Full name of the student, group

Variant: 127 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 50$ kN; $P_4 = 70$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

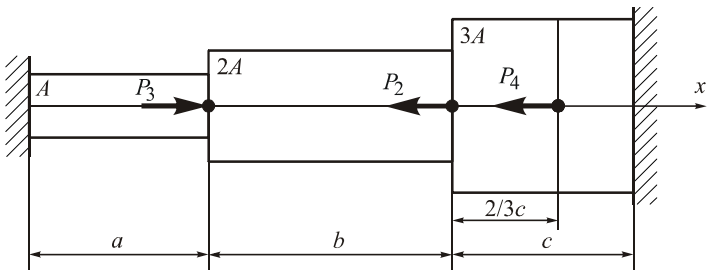
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 128 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 60$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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Subject: mechanics of materials
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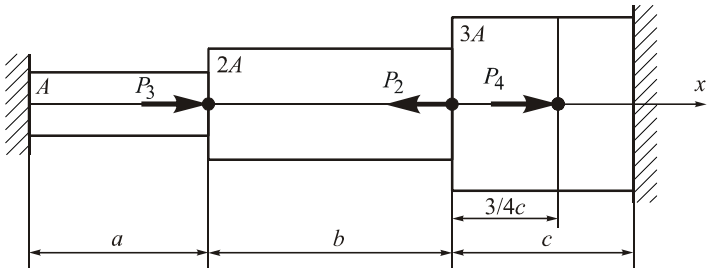
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 129 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 30$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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Subject: mechanics of materials
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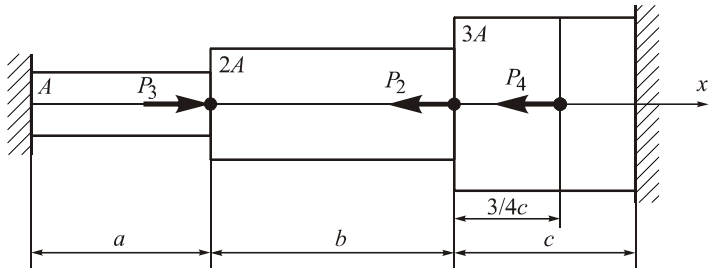
Full name of the student, group

Variant: 130 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 20$ kN; $P_4 = 40$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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Subject: mechanics of materials
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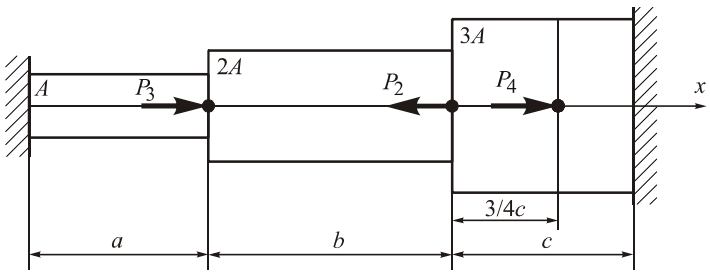
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 131 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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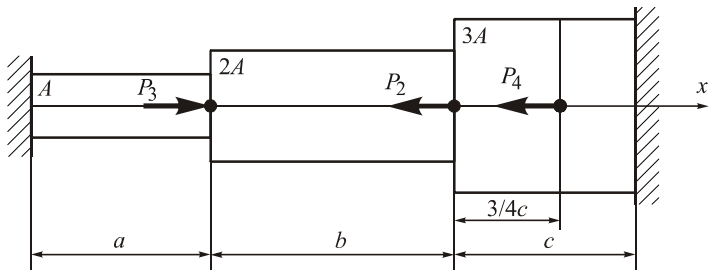
Variant: 132 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 20$ kN; $P_4 = 30$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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Subject: mechanics of materials
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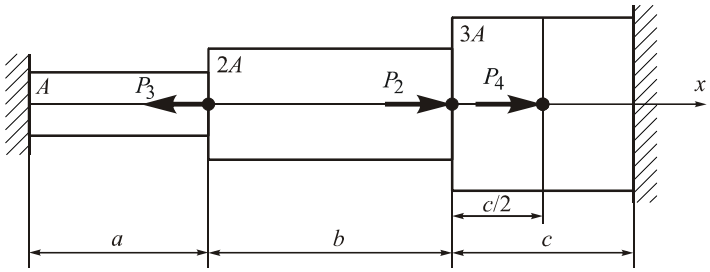
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 133 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 30$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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Subject: mechanics of materials
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Topic: Stresses and elongations in statically indeterminate rods in tension-compression
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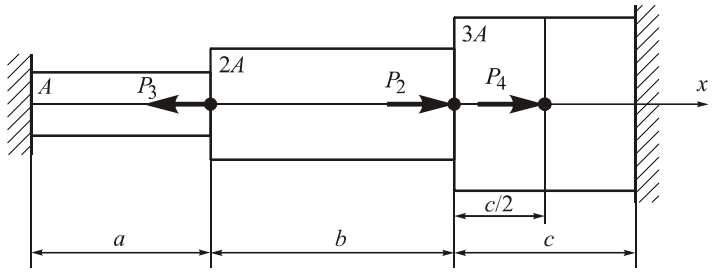
Variant: 134 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 40$ kN; $P_4 = 60$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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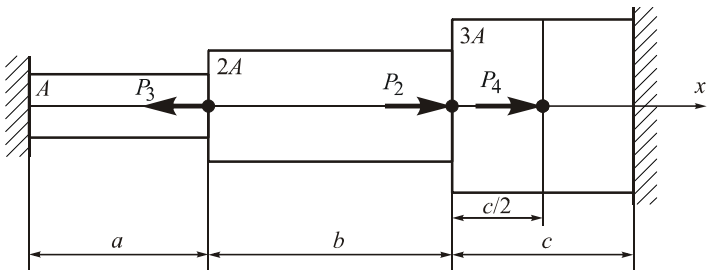
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 135 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 60$ kN; $P_4 = 80$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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Subject: mechanics of materials
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Topic: Stresses and elongations in statically indeterminate rods in tension-compression
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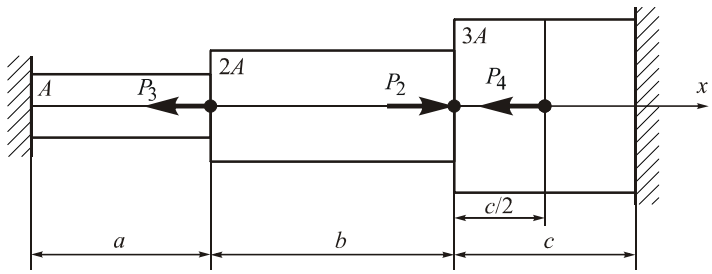
Variant: 136 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 40$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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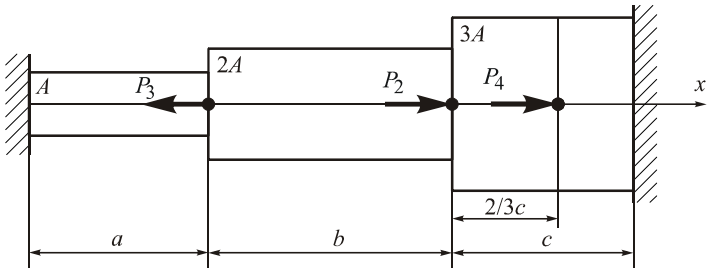
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 137 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 60$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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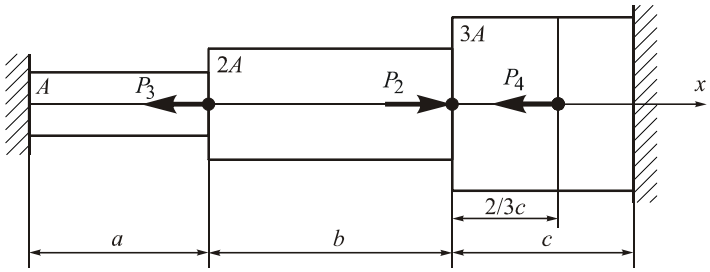
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 138 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 50$ kN; $P_3 = 70$ kN; $P_4 = 90$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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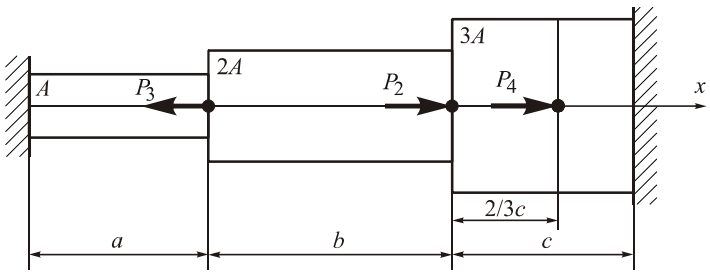
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 139 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 50$ kN; $P_3 = 60$ kN; $P_4 = 70$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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"Kharkiv Aviation Institute"
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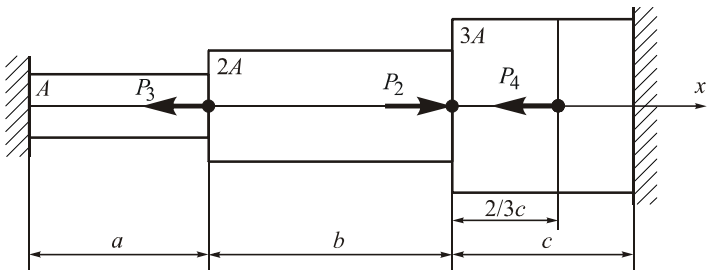
Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 140 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 40$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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Subject: mechanics of materials
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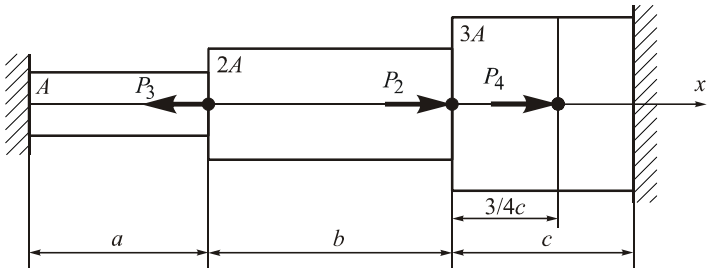
Full name of the student, group

Variant: 141 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 50$ kN; $P_4 = 70$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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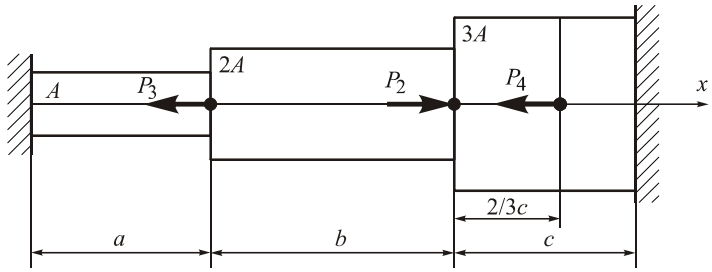
Full name of the student, group

Variant: 142 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 40$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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Subject: mechanics of materials
Document: home problem
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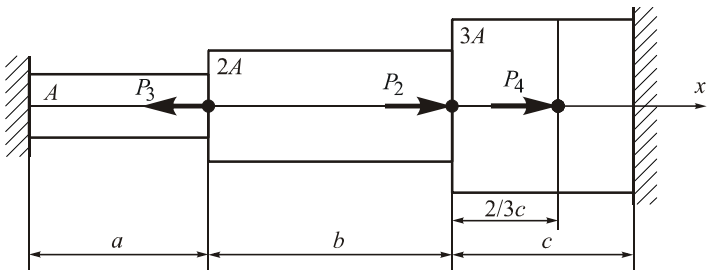
Full name of the student, group

Variant: 143 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 20$ kN; $P_4 = 40$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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Document: home problem
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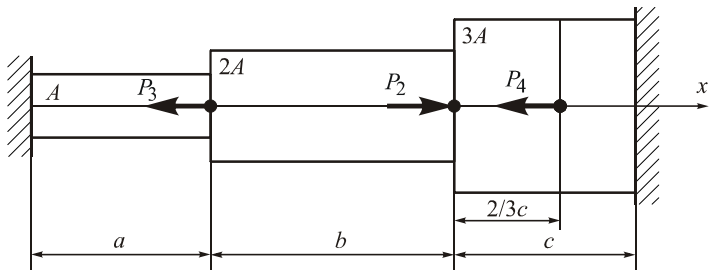
Full name of the student, group

Variant: 144 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{ñ} = 200$ MPa;
$P_2 = 10$ kN; $P_3 = 30$ kN; $P_4 = 40$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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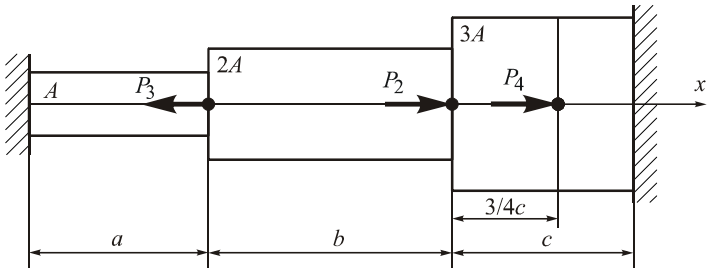
Full name of the student, group

Variant: 145 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 30$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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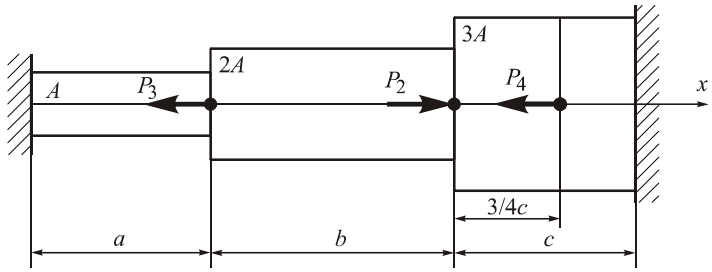
Variant: 146 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 40$ kN; $P_4 = 50$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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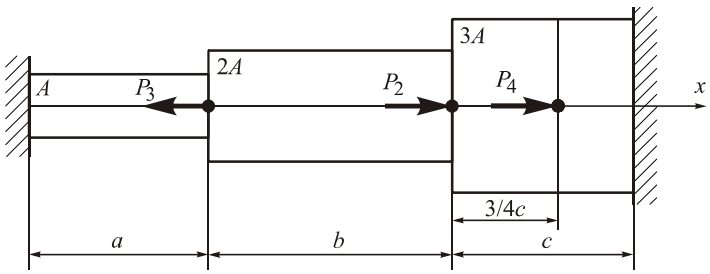
Variant: 147 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 20$ kN; $P_3 = 30$ kN; $P_4 = 40$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

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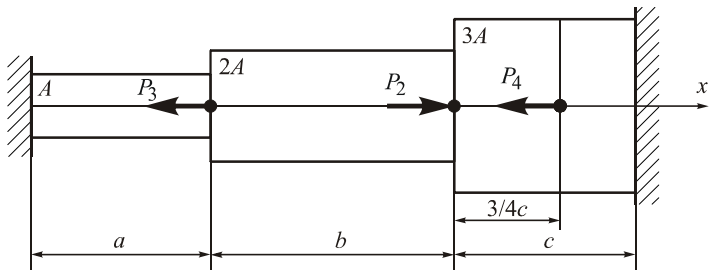
Full name of the student, group

Variant: 148 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 30$ kN; $P_3 = 50$ kN; $P_4 = 70$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

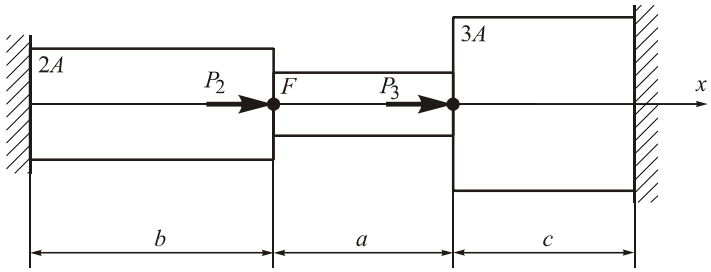
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 149 **Complexity: 1**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 40$ kN; $P_3 = 50$ kN.
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

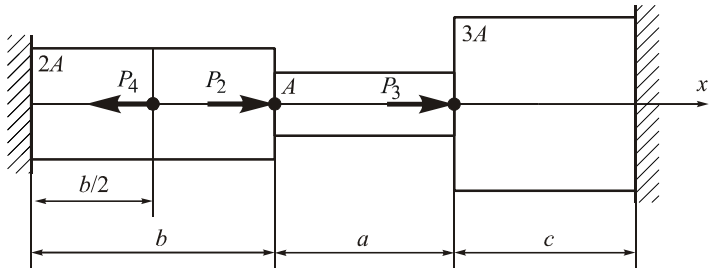
Full name of the lecturer **signature**

Mark: **Mark:**

National aerospace university
"Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stresses and elongations in statically indeterminate rods in tension-compression
Full name of the student, group

Variant: 150 **Complexity: 2**



Given: $[s]_t = 160$ MPa; $[s]_{\tilde{n}} = 200$ MPa;
$P_2 = 40$ kN; $P_3 = 50$ kN; $P_4 = 60$ kN,
$a = 3$ m, $b = 4$ m, $c = 5$ m.
Goal:
1) open static indeterminacy and design the graph on normal forces;
2) calculate cross-sectional area F;
3) calculate acting stresses in the portions of the rod and design the graph of their distribution along the length of the rod;
4) design the graph of the rod elongations;
5) estimate stress state in critical cross-section.

Full name of the lecturer **signature**

Mark: **Mark:**