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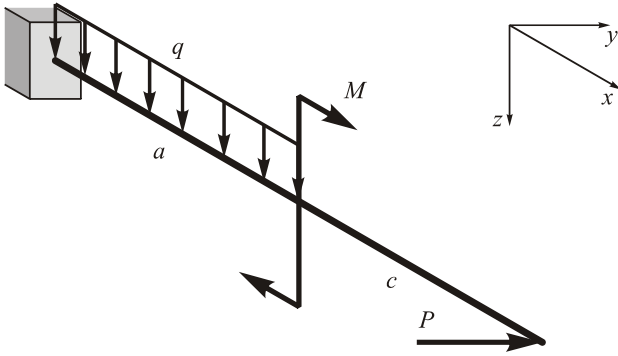## Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 1 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
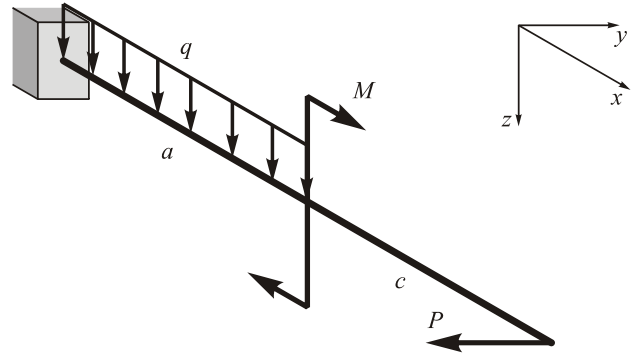
signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 2 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
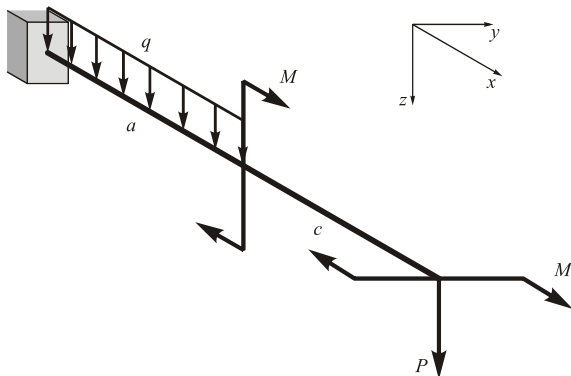
signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 3 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
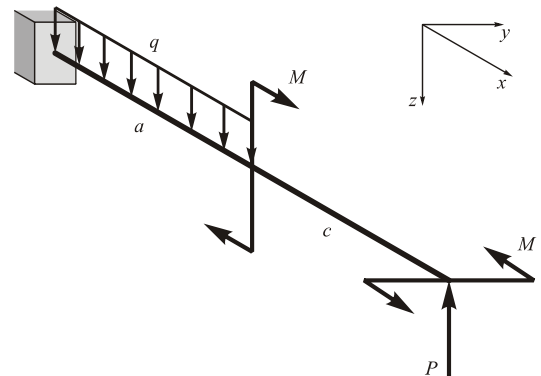4) analytically find position of neutral axis in critical cross-section.

signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 4 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
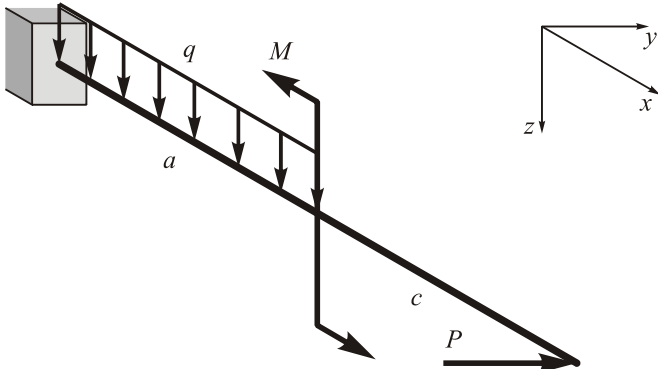4) analytically find position of neutral axis in critical cross-section.

signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 5   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
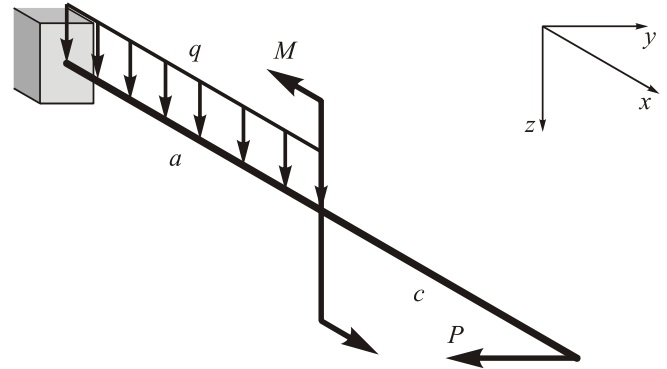**signature**

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 6   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
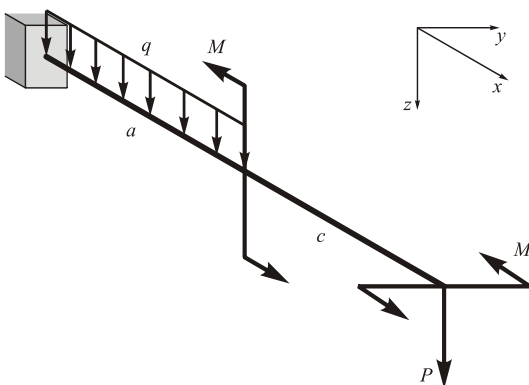**signature**

Full name of the lecturer

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National aerospace university
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Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 7   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
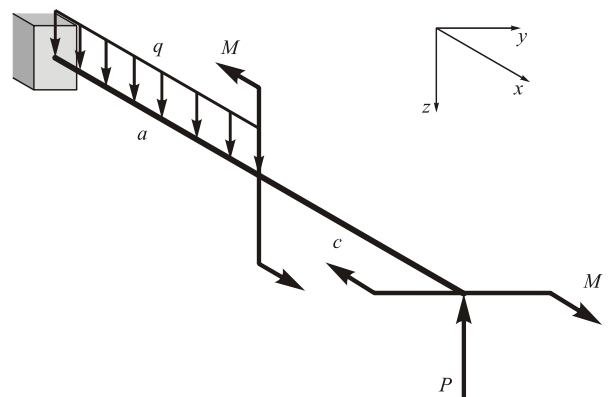**signature**

Full name of the lecturer

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 8   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
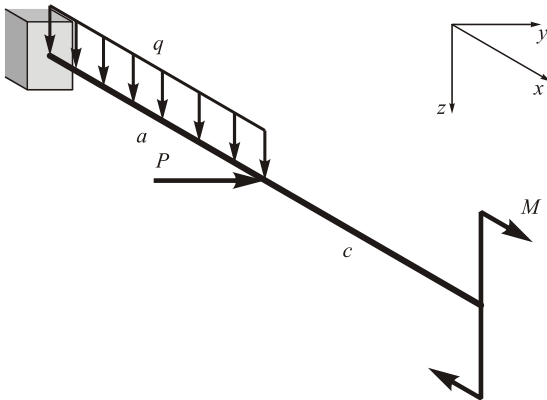**signature**

Full name of the lecturer

Mark:

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"Kharkiv Aviation Institute"
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Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 9 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
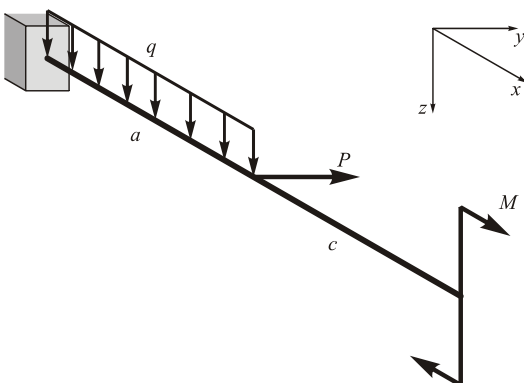   **signature**
  Full name of the lecturer

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National aerospace university
"Kharkiv Aviation Institute"
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Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 10 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
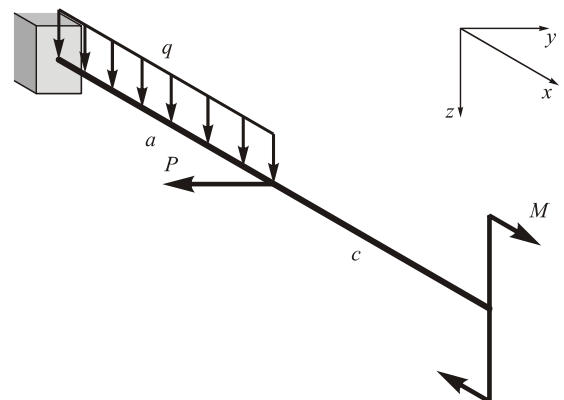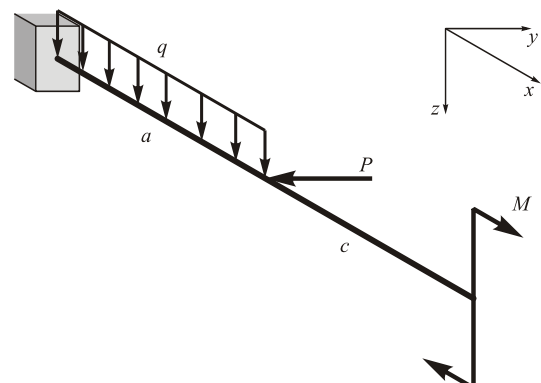   **signature**
  Full name of the lecturer

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Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 11 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
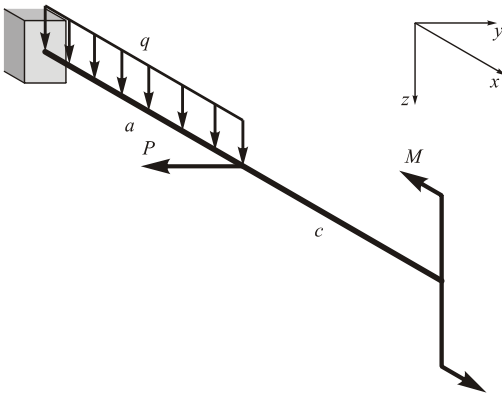   **signature**
  Full name of the lecturer

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Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 12 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
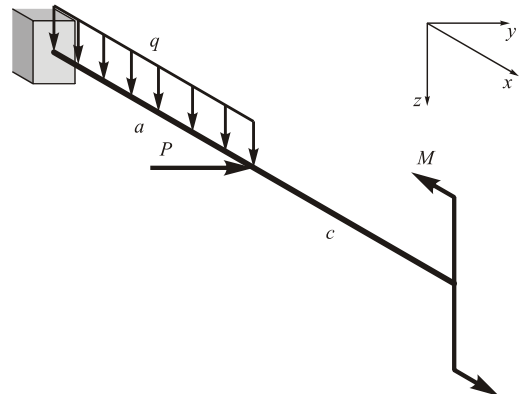   **signature**
  Full name of the lecturer

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Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 13   **Complexity: 1**

Given: $q = 10\,\text{kN/m};\ P = 20\,\text{kN};\ M = 10\,\text{kNm};\ [\sigma] = 160\,\text{MPa};\ a = 2\,\text{m},$
$c = 4\,\text{m}.$ Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
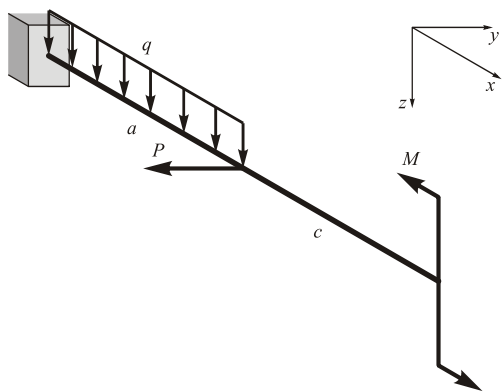   **signature**
  Full name of the lecturer

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 14   **Complexity: 1**

Given: $q = 10\,\text{kN/m};\ P = 20\,\text{kN};\ M = 10\,\text{kNm};\ [\sigma] = 160\,\text{MPa};\ a = 2\,\text{m},$
$c = 4\,\text{m}.$ Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
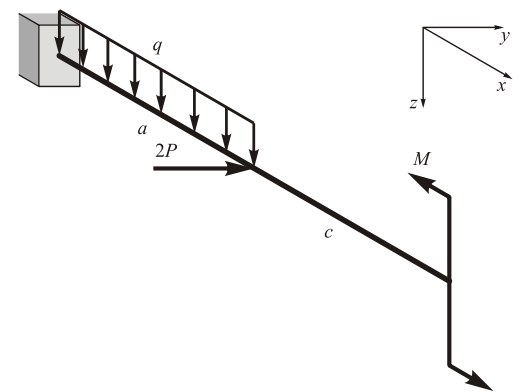   **signature**
  Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 15   **Complexity: 1**

Given: $q = 10\,\text{kN/m};\ P = 20\,\text{kN};\ M = 10\,\text{kNm};\ [\sigma] = 160\,\text{MPa};\ a = 2\,\text{m},$
$c = 4\,\text{m}.$ Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
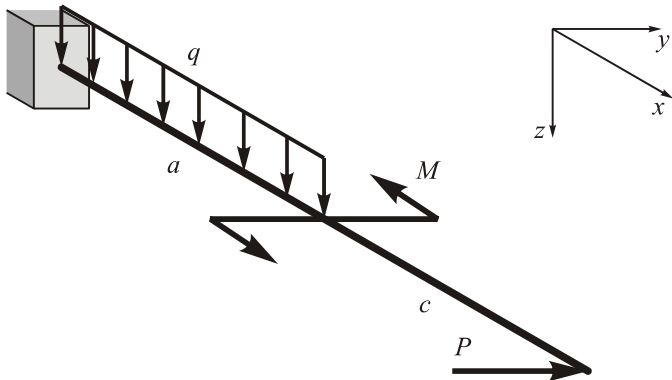   **signature**
  Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 16   **Complexity: 1**

Given: $q = 10\,\text{kN/m};\ P = 20\,\text{kN};\ M = 10\,\text{kNm};\ [\sigma] = 160\,\text{MPa};\ a = 2\,\text{m},$
$c = 4\,\text{m}.$ Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
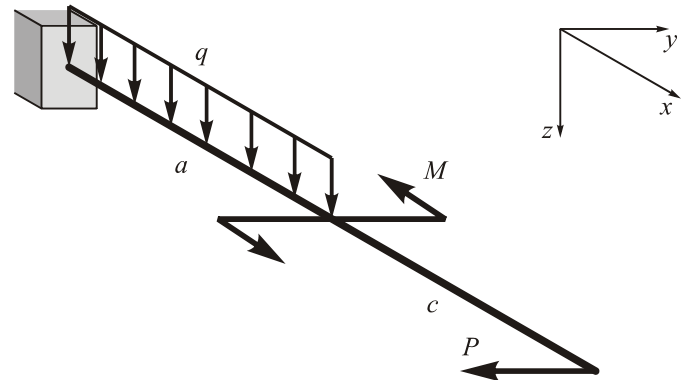   **signature**
  Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 17   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
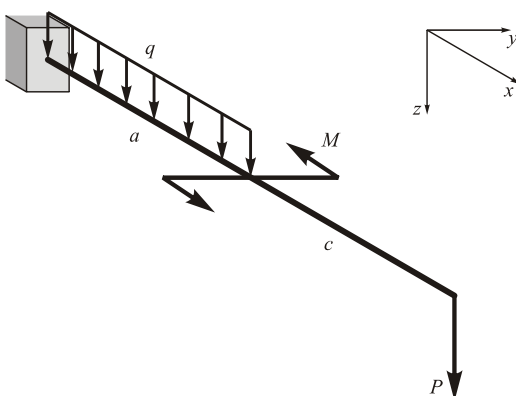   **signature**
  Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 18   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
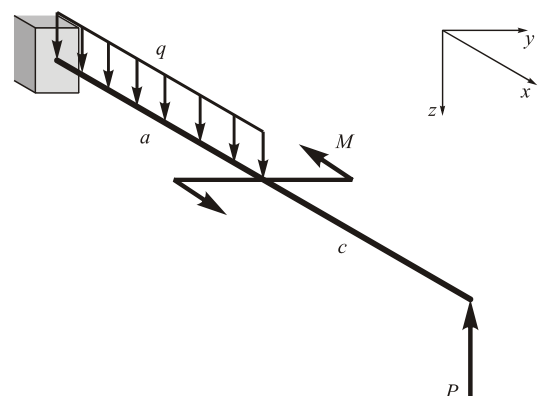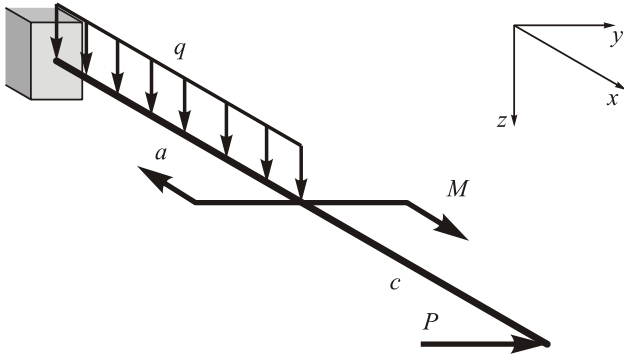   **signature**
  Full name of the lecturer

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 19   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
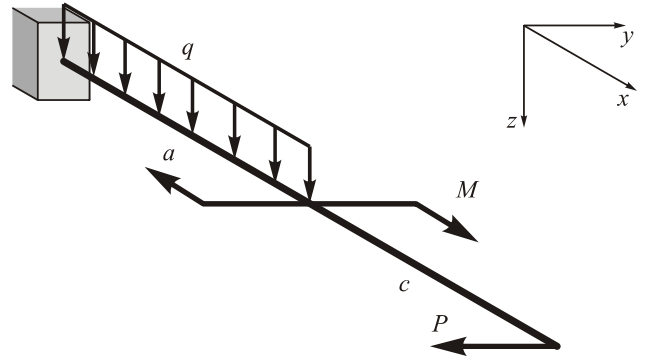   **signature**
  Full name of the lecturer

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 20   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
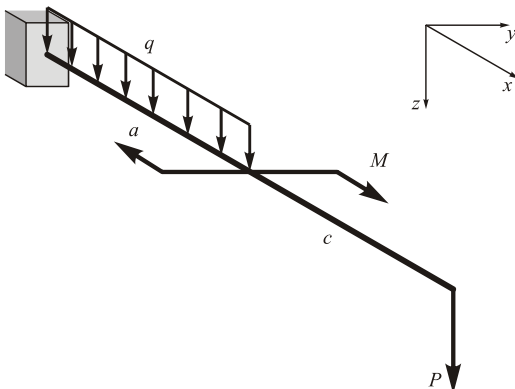   **signature**
  Full name of the lecturer

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Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 21   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:

1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

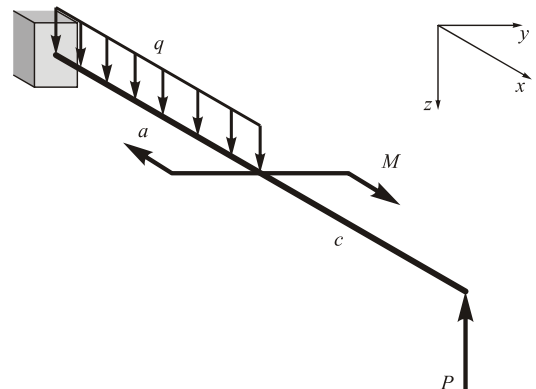   **signature**

  Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 22   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:

1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

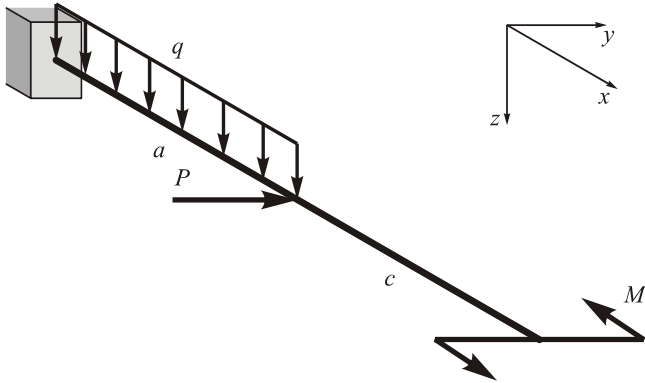   **signature**

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Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 23   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:

1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

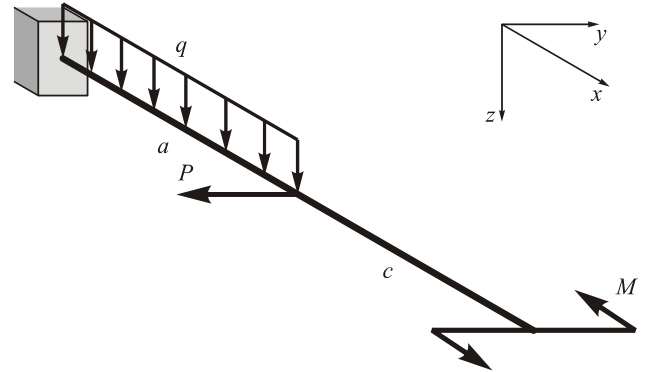   **signature**

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 24   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:

1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

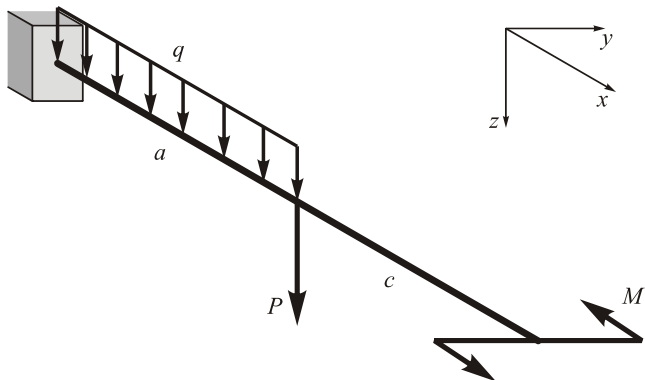   **signature**

  Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 25   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
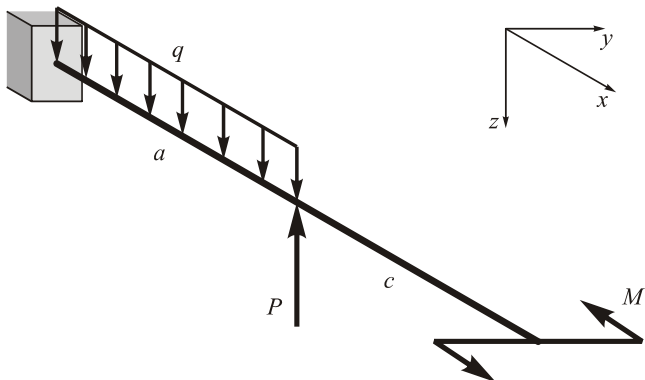4) analytically find position of neutral axis in critical cross-section.

signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 26   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
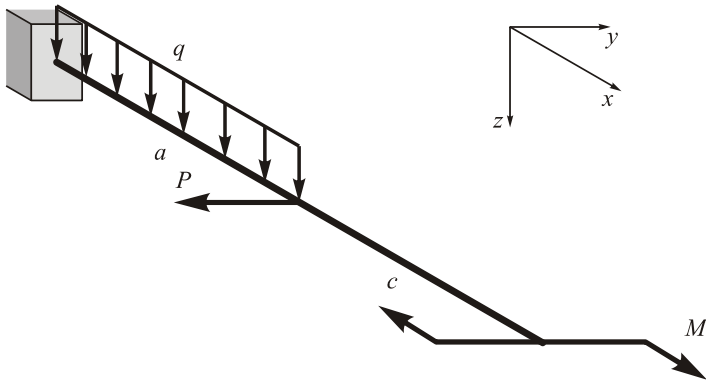
signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 27   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
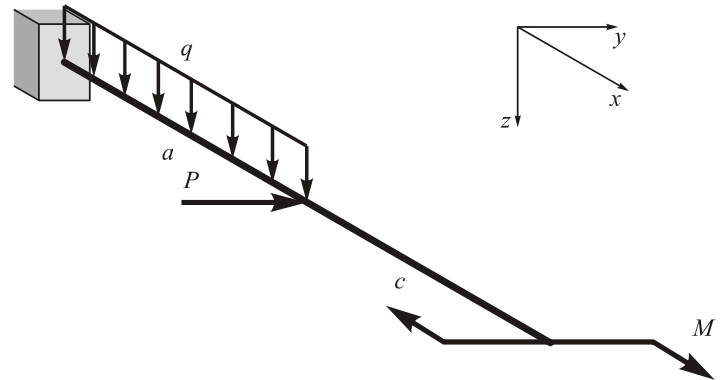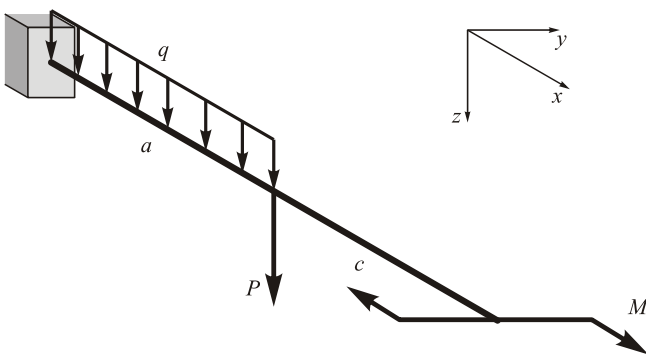
signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 28   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

signature

Full name of the lecturer

Mark:

Variant: 29   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

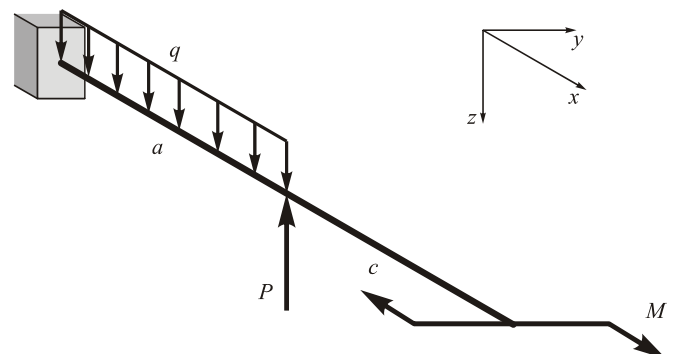   **signature**

  Full name of the lecturer

Mark:

Variant: 30   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

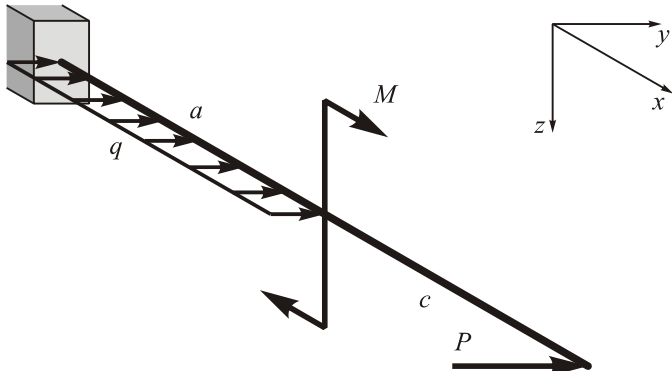   **signature**

  Full name of the lecturer

Mark:

Variant: 31   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
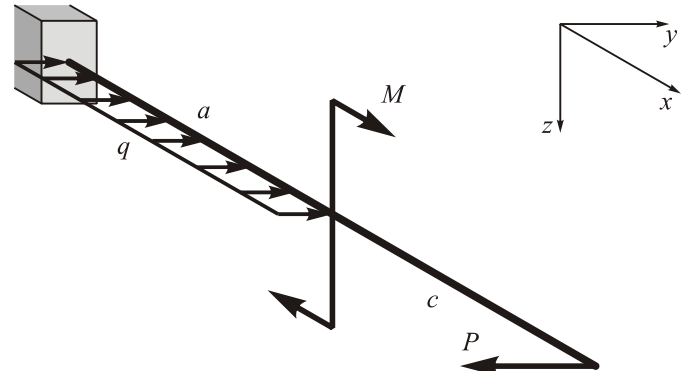
                                             signature

  Full name of the lecturer

Mark:

Variant: 32   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

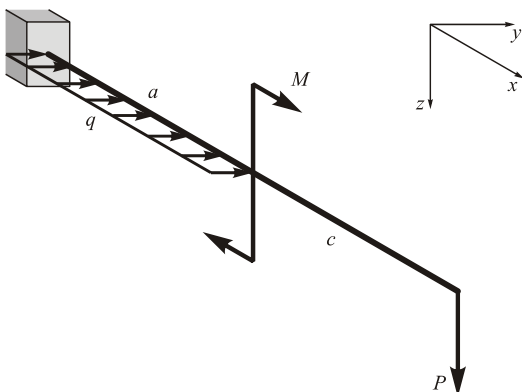   **signature**

  Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 33 **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
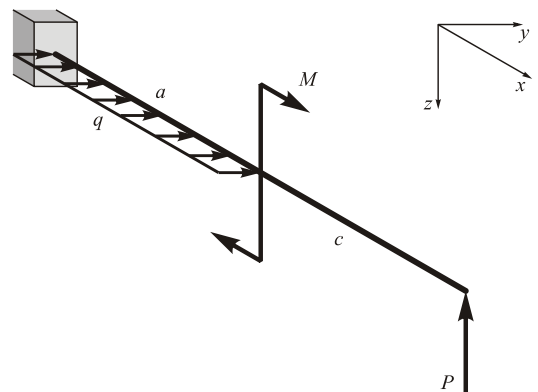
signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 34 **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
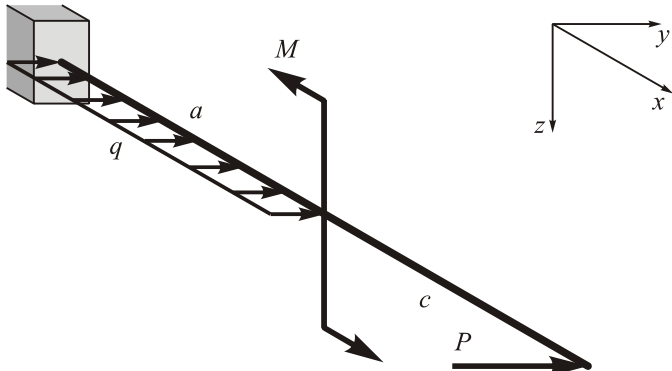4) analytically find position of neutral axis in critical cross-section.

signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 35 **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
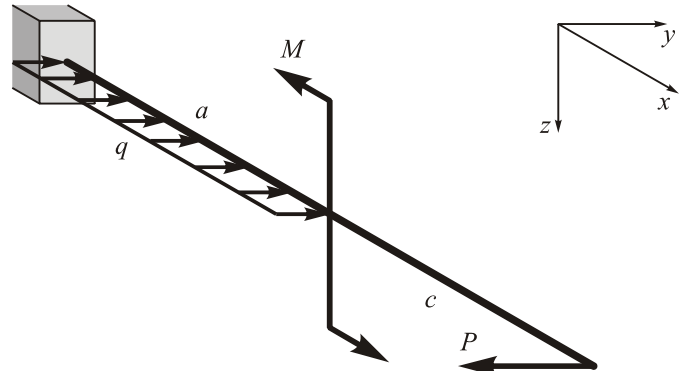4) analytically find position of neutral axis in critical cross-section.

signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 36 **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
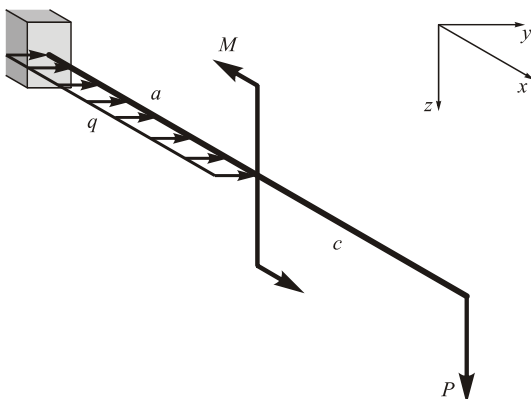
signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 37   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
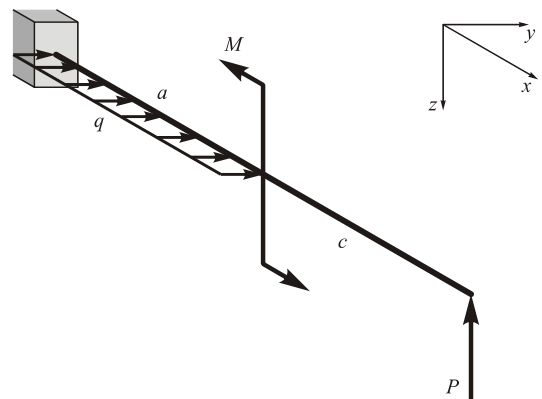
                                            signature
Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 38   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
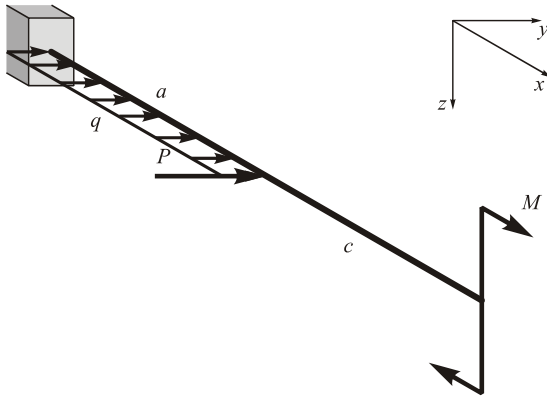
                                            signature
Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 39   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

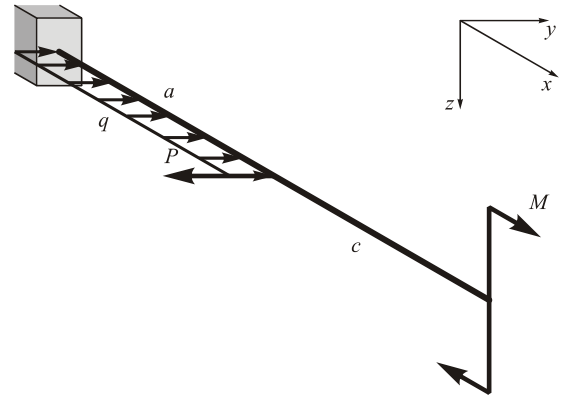   **signature**
Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 40   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
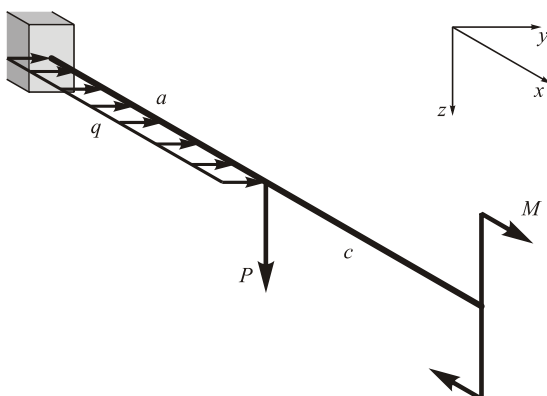
                                            signature
Full name of the lecturer

Mark:

Variant: 41   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
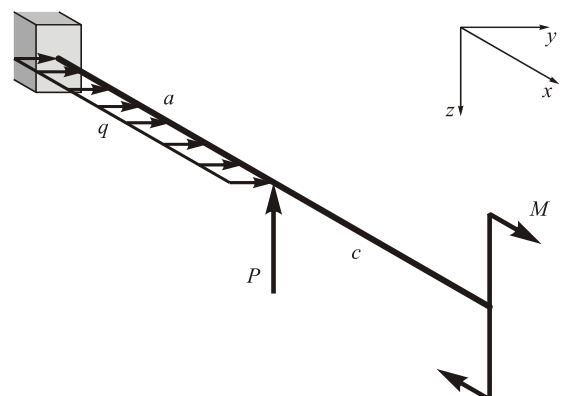   **signature**

  Full name of the lecturer

Mark:

Variant: 42   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
                                              signature

  Full name of the lecturer

Mark:

Variant: 43   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
                                              signature
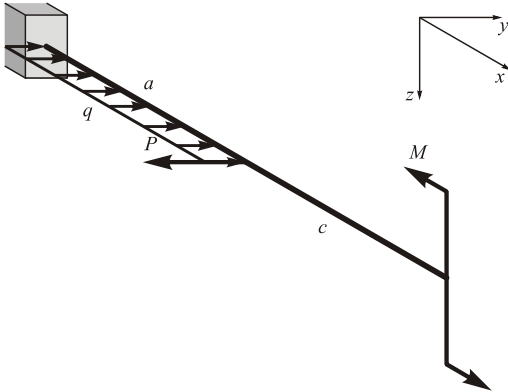
  Full name of the lecturer

Mark:

Variant: 44   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
                                              signature
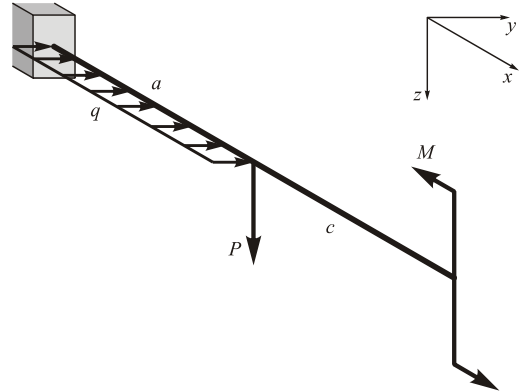
  Full name of the lecturer

Mark:

Variant: 45   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:

1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;

3) find critical point in critical section and estimate the strength of the beam;

4) analytically find position of neutral axis in critical cross-section.

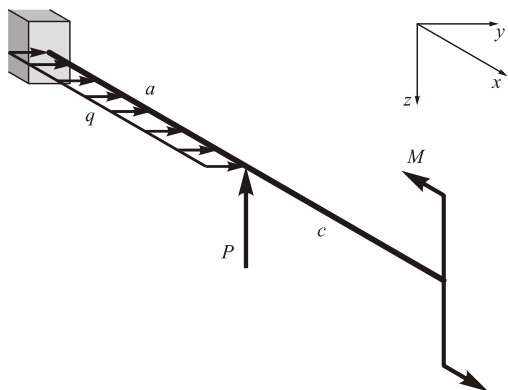   **signature**

Full name of the lecturer

Mark:

Variant: 46   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:

1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;

3) find critical point in critical section and estimate the strength of the beam;

4) analytically find position of neutral axis in critical cross-section.

                                                                 signature

Full name of the lecturer

Mark:

Variant: 47   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:

1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;

3) find critical point in critical section and estimate the strength of the beam;

4) analytically find position of neutral axis in critical cross-section.

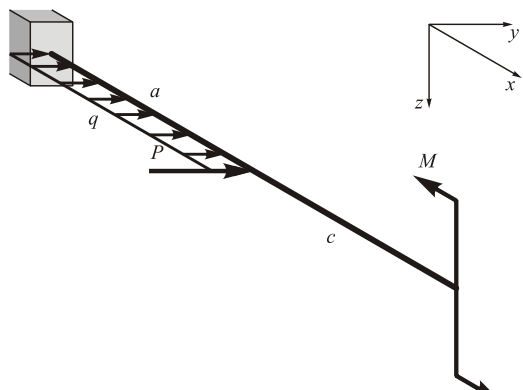   **signature**

Full name of the lecturer

Mark:

Variant: 48   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:

1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;

3) find critical point in critical section and estimate the strength of the beam;

4) analytically find position of neutral axis in critical cross-section.

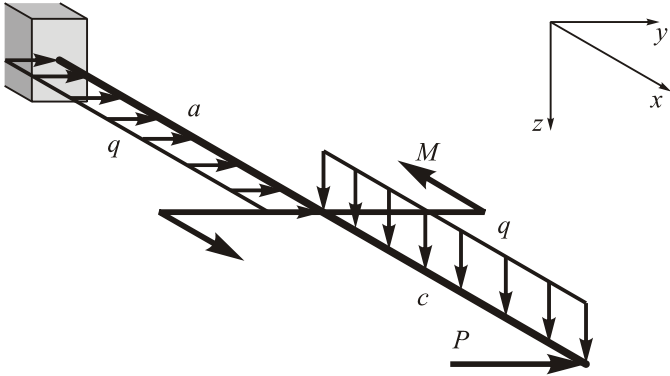   **signature**

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 49　　　　　　　**Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
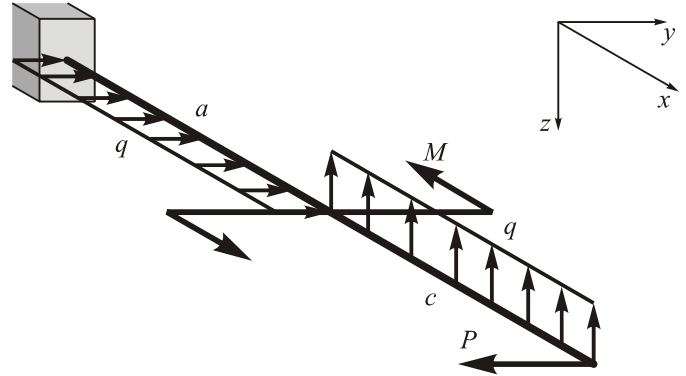　　　　　　　　　　　　　　　　　　　　　　　**signature**

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 50　　　　　　　**Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
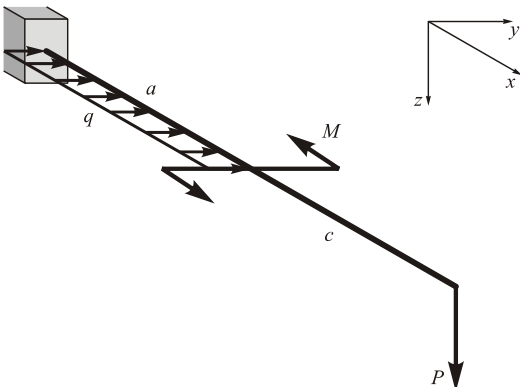　　　　　　　　　　　　　　　　　　　　　　　**signature**

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 51　　　　　　　**Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
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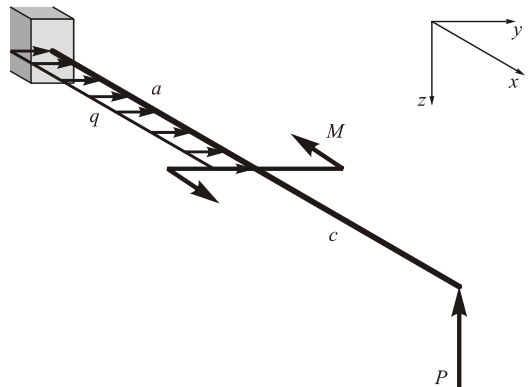
Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 52　　　　　　　**Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
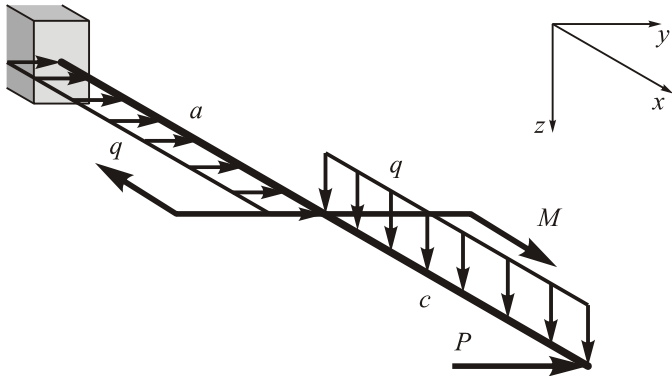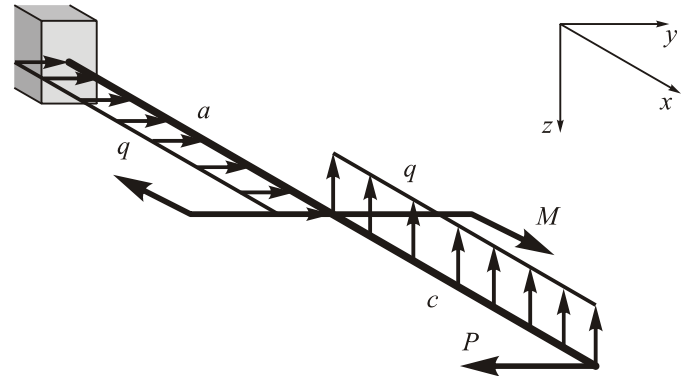　　　　　　　　　　　　　　　　　　　　　　　**signature**

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 53   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

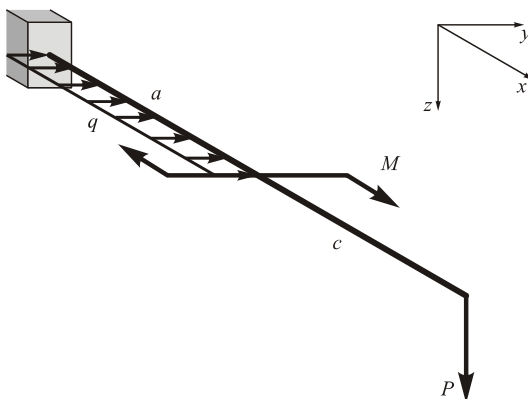   **signature**
  Full name of the lecturer

Mark:

Variant: 54   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

                                                    signature
  Full name of the lecturer

Mark:

Variant: 55   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

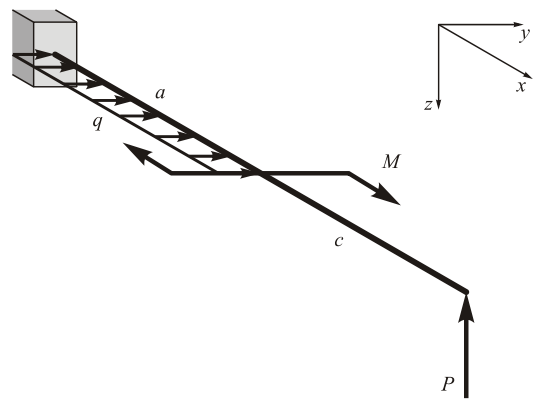   **signature**
  Full name of the lecturer

Mark:

Variant: 56   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

                                                    signature
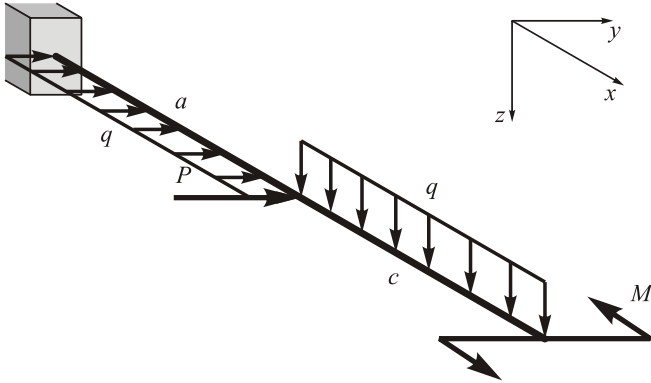 **Full name of the lecturer**

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 57   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
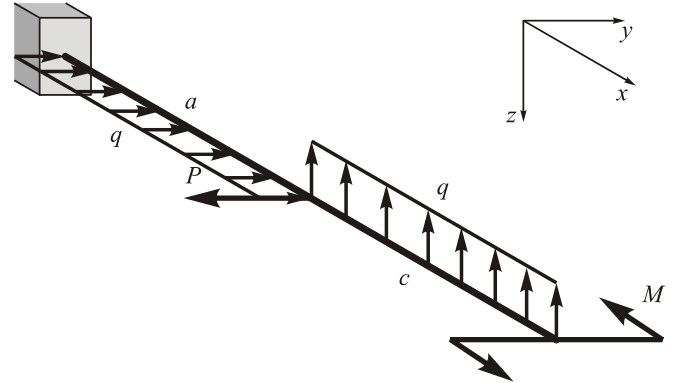
signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 58   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

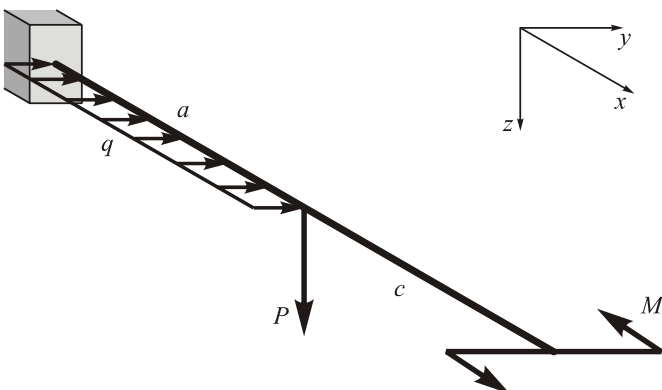**signature**

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 59   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
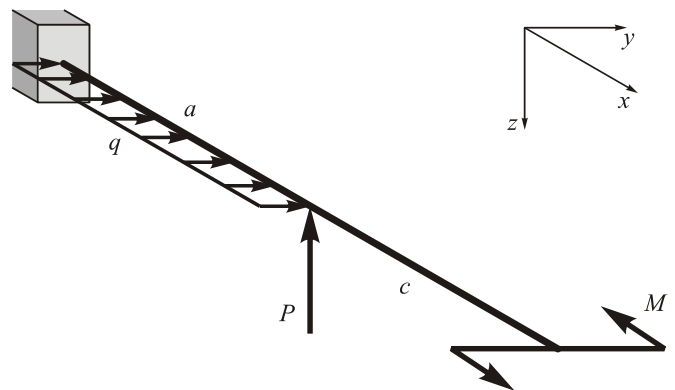
signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 60   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
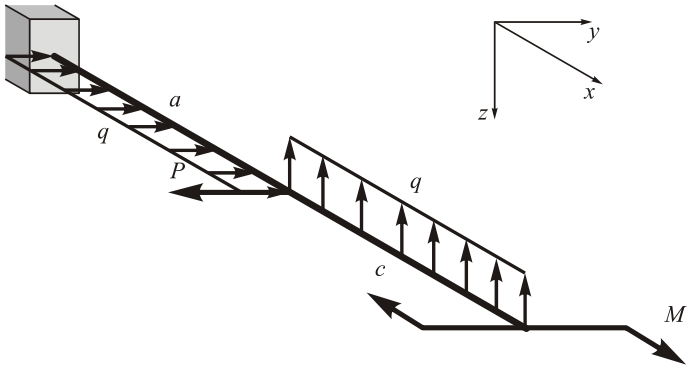
signature

Full name of the lecturer

Mark:

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 61 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
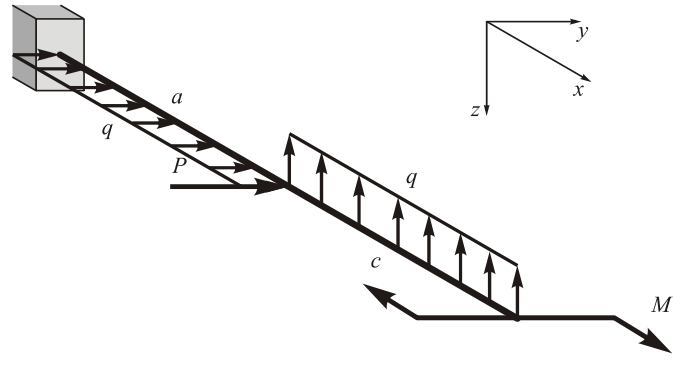
signature

Full name of the lecturer

Mark:

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 62 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

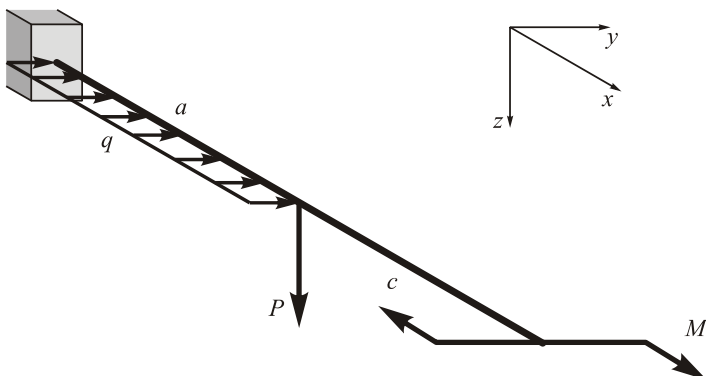**signature**

Full name of the lecturer

Mark:

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 63 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
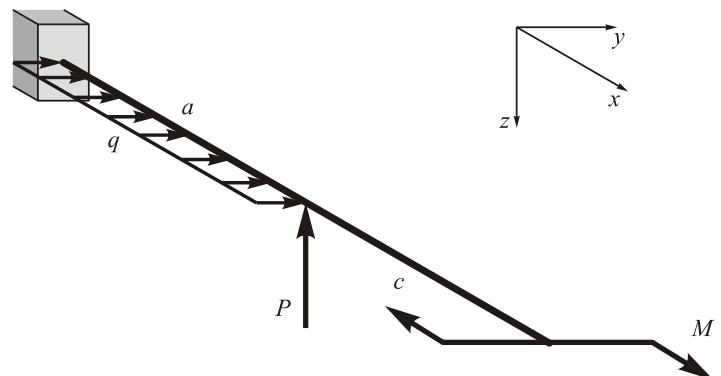
signature

Full name of the lecturer

Mark:

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 64 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
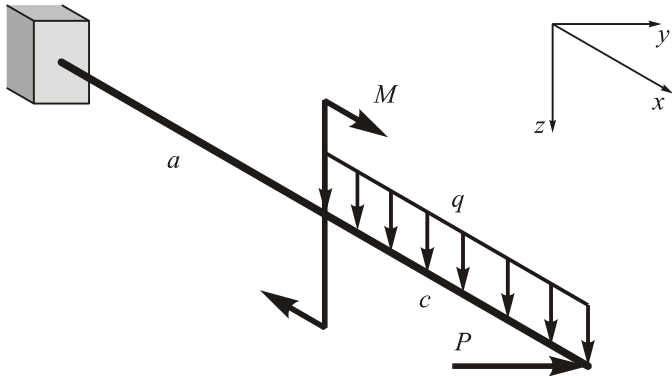
signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 65 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

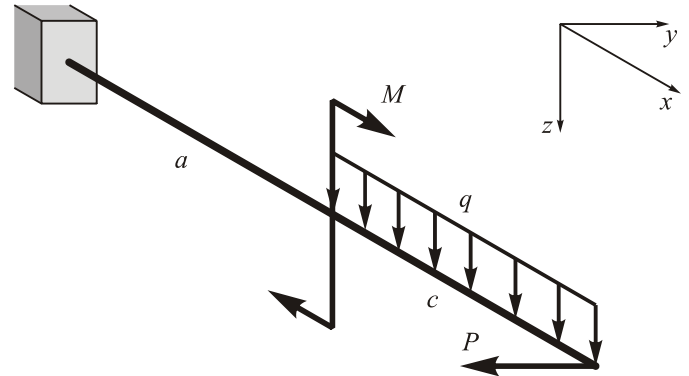**signature**

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 66 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
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2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

signature
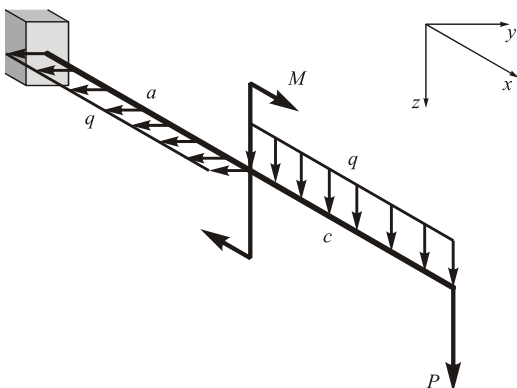
Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 67 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
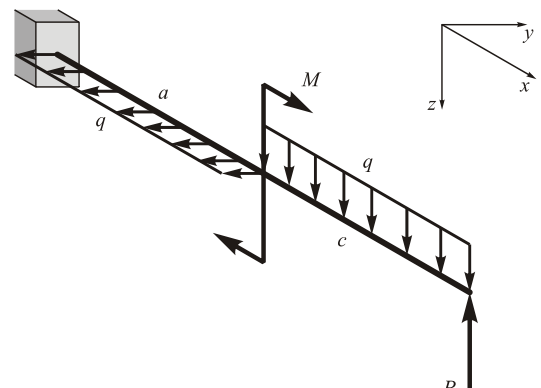
signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 68 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
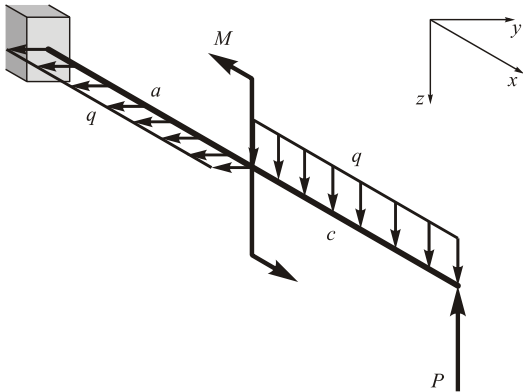4) analytically find position of neutral axis in critical cross-section.

signature

Full name of the lecturer

Mark:

Variant: 69   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
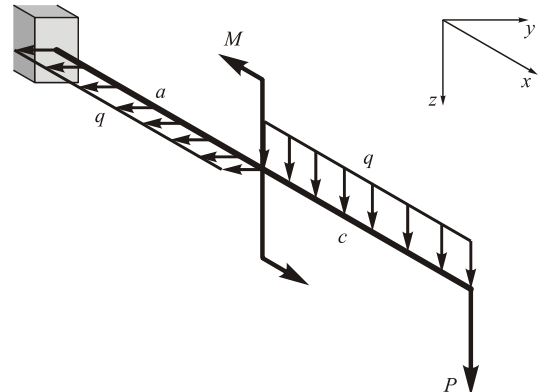4) analytically find position of neutral axis in critical cross-section.

signature

Full name of the lecturer

Mark:

Variant: 70   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

signature

Full name of the lecturer

Mark:

Variant: 71   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
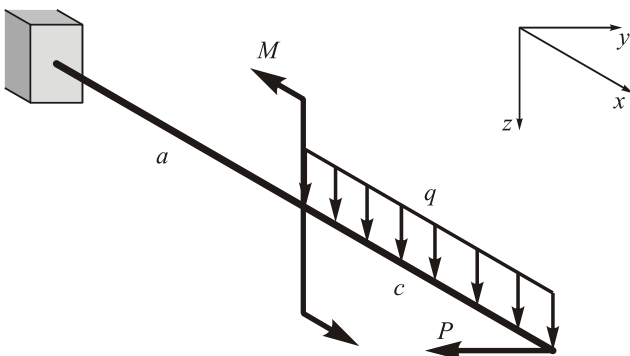4) analytically find position of neutral axis in critical cross-section.

signature

Full name of the lecturer

Mark:

Variant: 72   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
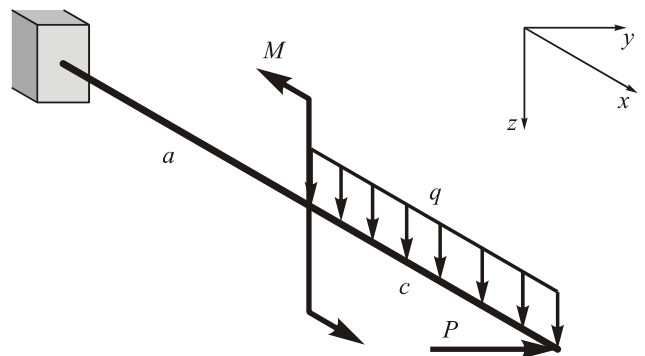4) analytically find position of neutral axis in critical cross-section.

signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 73   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

signature

Full name of the lecturer

Mark:

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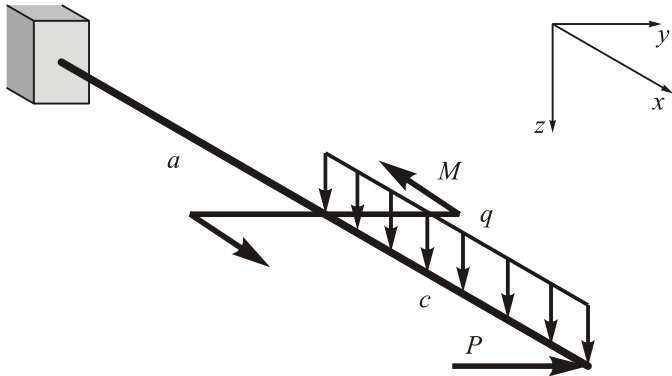### "Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 74   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

signature

Full name of the lecturer

Mark:

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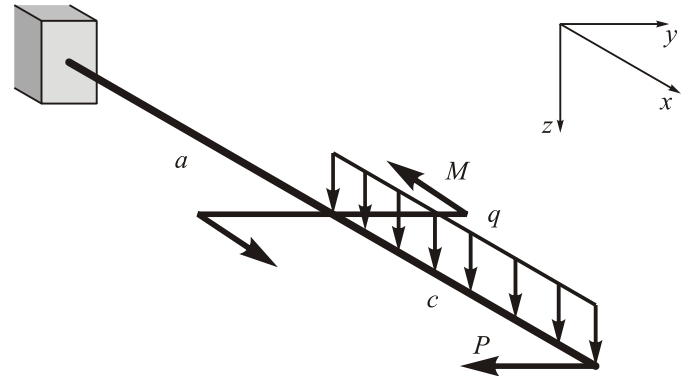### "Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 75   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

signature

Full name of the lecturer

Mark:

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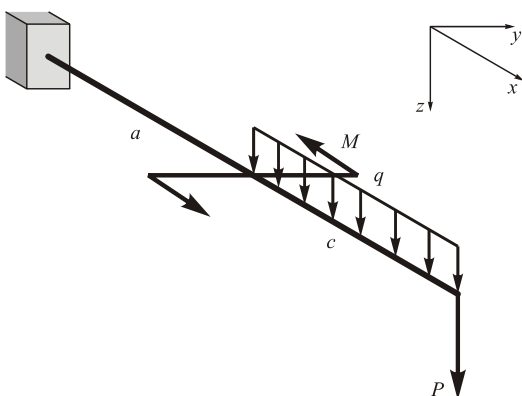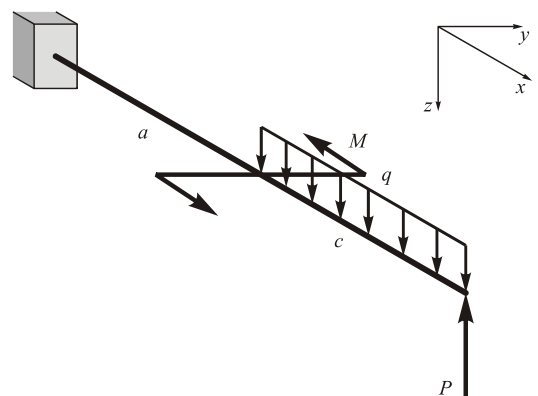### "Kharkiv Aviation Institute"
Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 76   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

signature

Full name of the lecturer

Mark:

Variant: 77   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

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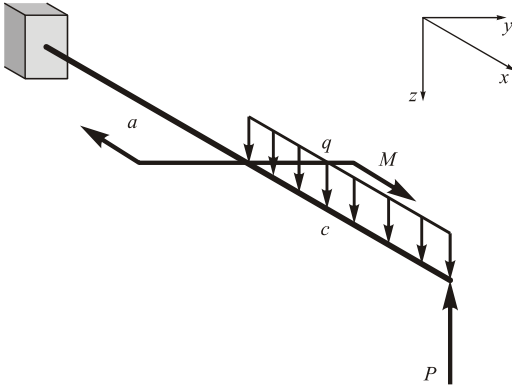
Full name of the lecturer

Mark:

Variant: 78   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

<div align="right">**signature**</div>

Full name of the lecturer

Mark:

Variant: 79   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

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3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

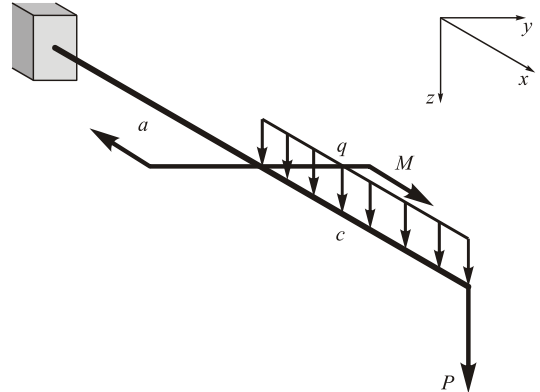<div align="right">**signature**</div>

Full name of the lecturer

Mark:

Variant: 80   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
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3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

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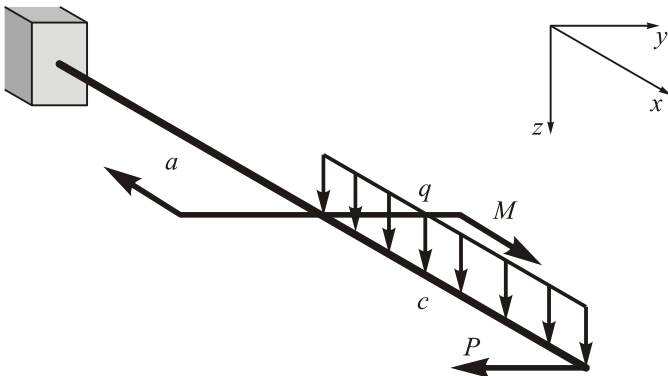
Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 81   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
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3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

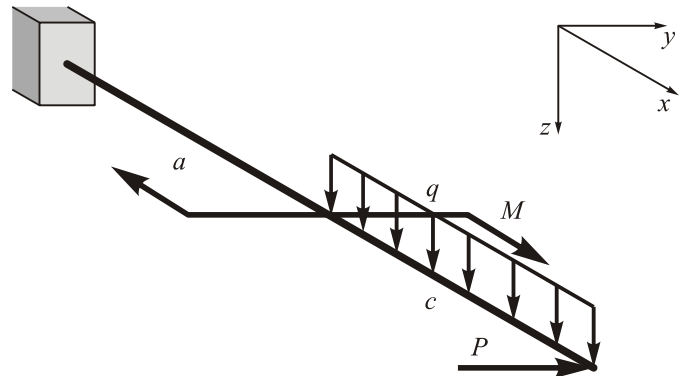**signature**

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 82   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;

3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
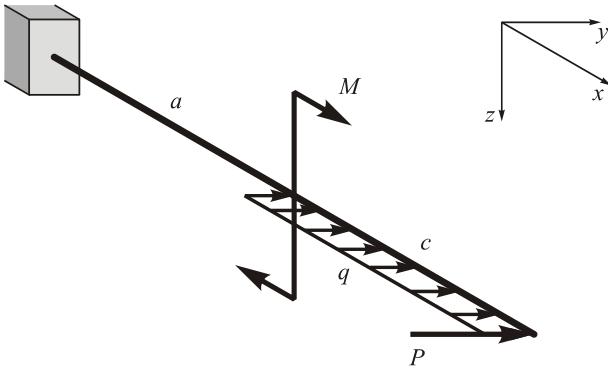
signature

Full name of the lecturer

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 83   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
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2) design the graph of stress distribution in critical cross-section;

3) find critical point in critical section and estimate the strength of the beam;
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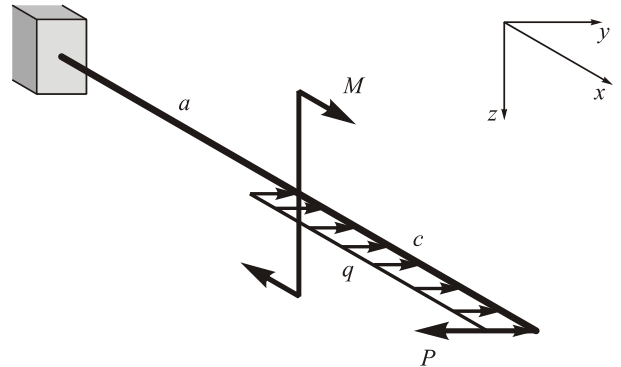
signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 84   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;

3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

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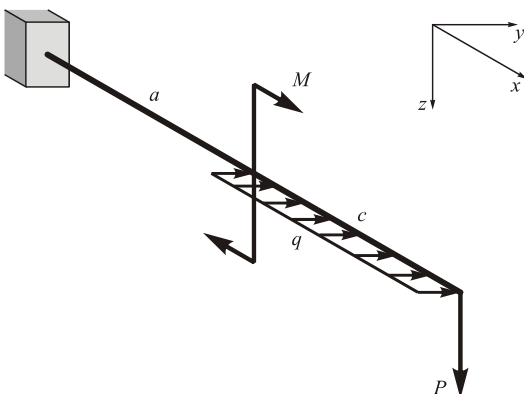
Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 85 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
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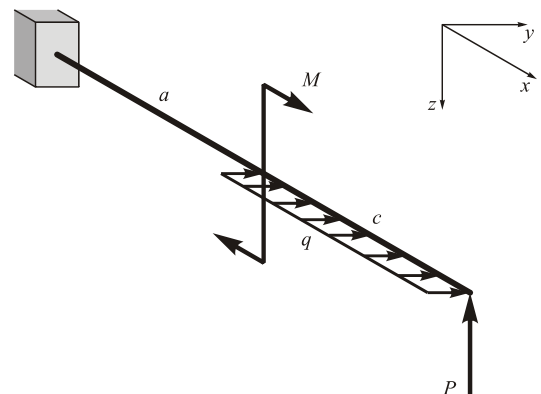
signature

Full name of the lecturer

Mark:

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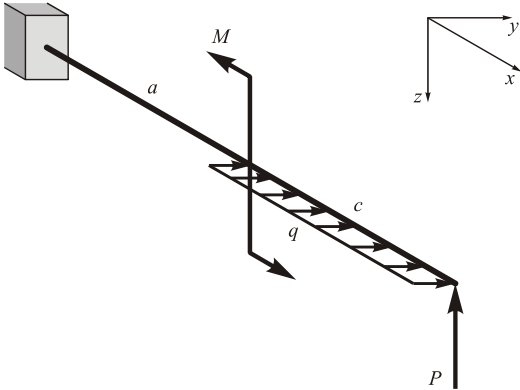## Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 86 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
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2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
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signature

Full name of the lecturer

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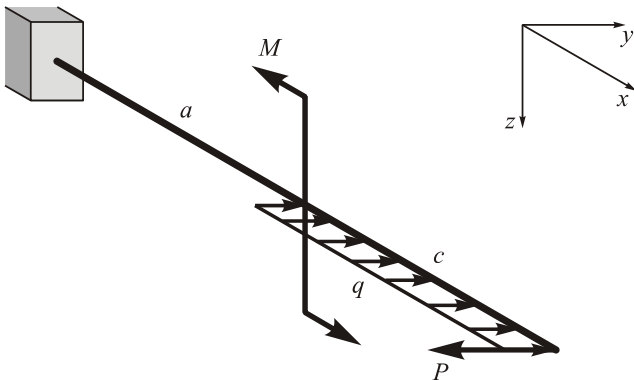## Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 87 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
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3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

signature

Full name of the lecturer

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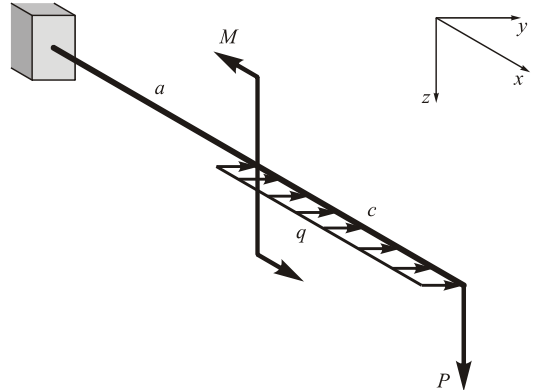## Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 88 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

signature

Full name of the lecturer

Mark:

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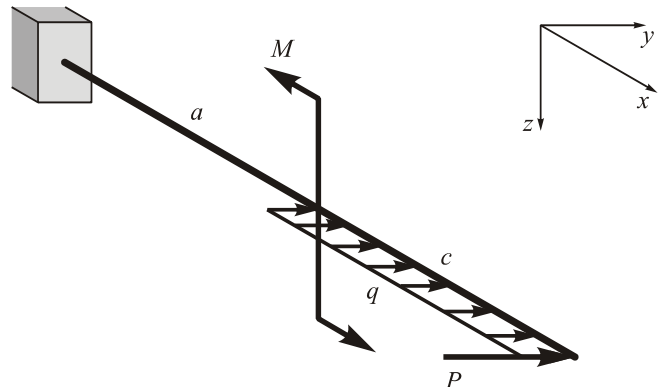### Department of aircraft strength

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 89   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
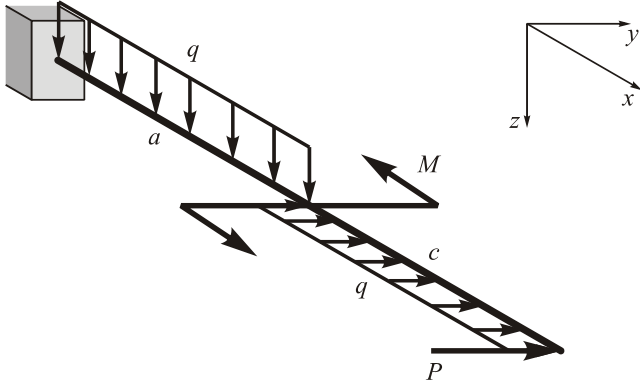
signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 90   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
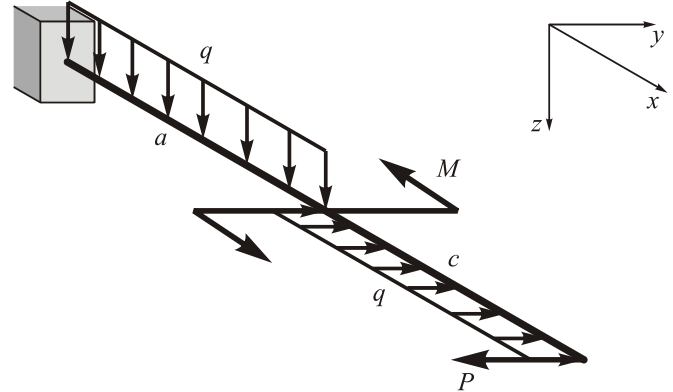4) analytically find position of neutral axis in critical cross-section.

signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 91   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
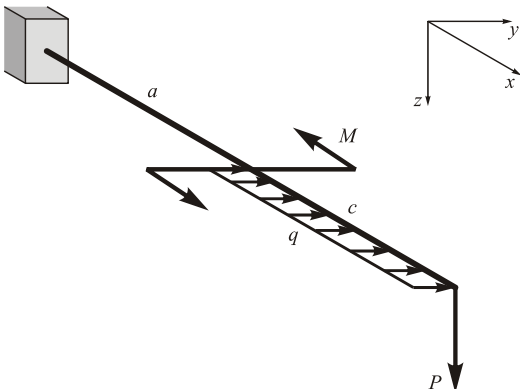4) analytically find position of neutral axis in critical cross-section.

signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 92   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
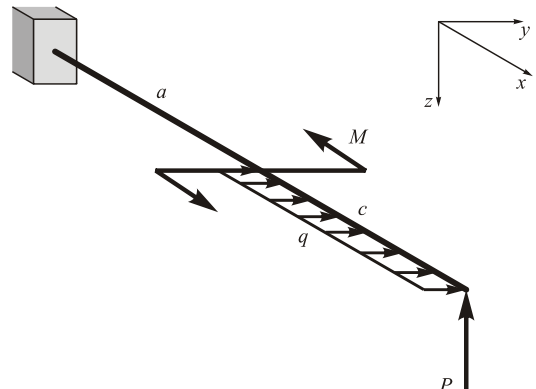4) analytically find position of neutral axis in critical cross-section.

signature

Full name of the lecturer

Mark:

Variant: 93   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
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2) design the graph of stress distribution in critical cross-section;

3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

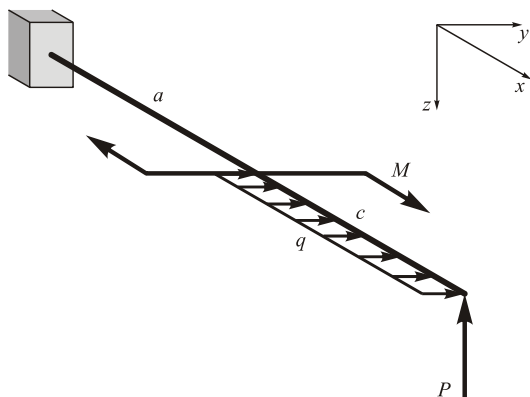   **signature**
  Full name of the lecturer

Mark:

Variant: 94   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
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2) design the graph of stress distribution in critical cross-section;

3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

                                            signature
  Full name of the lecturer

Mark:

Variant: 95   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

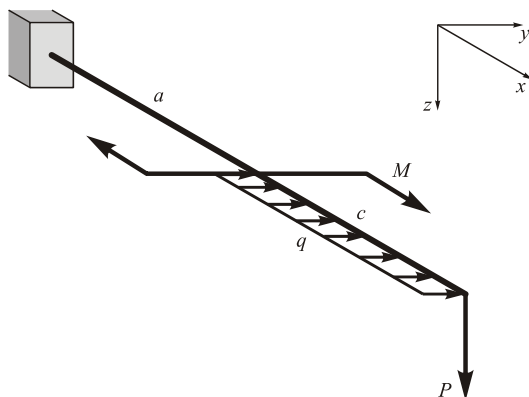   **signature**
  Full name of the lecturer

Mark:

Variant: 96   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
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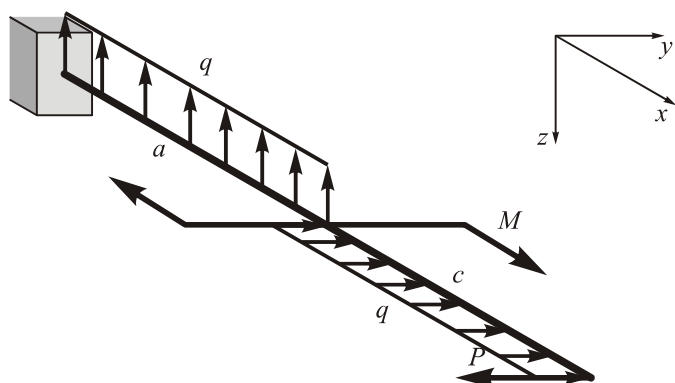 **Full name of the lecturer**

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 97   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
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                                             signature
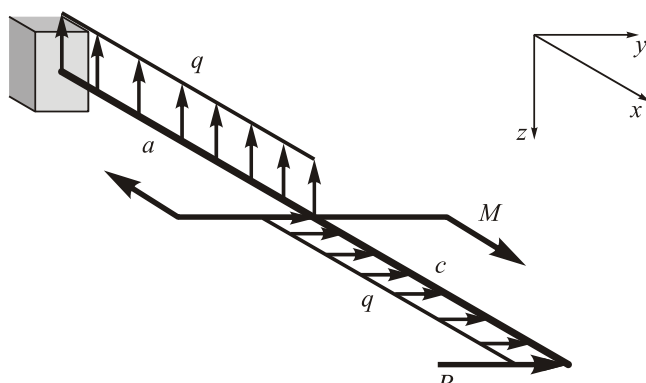
  Full name of the lecturer

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 98   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
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2) design the graph of stress distribution in critical cross-section;
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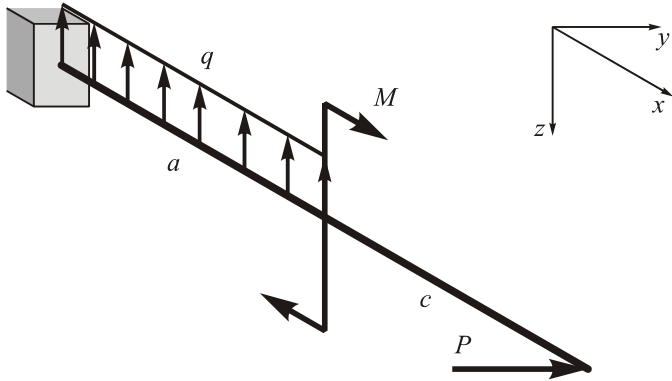   **signature**

  Full name of the lecturer

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 99   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

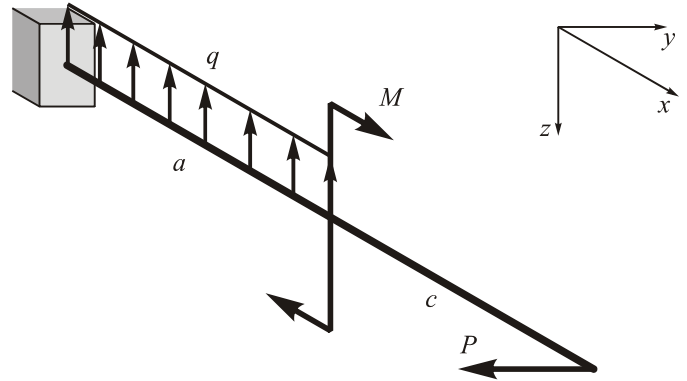   **signature**

  Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 100   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
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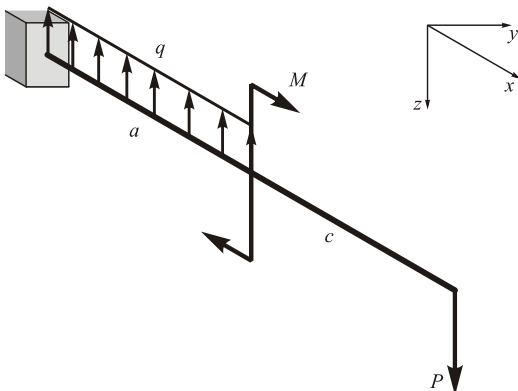
                                             signature

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Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 101   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
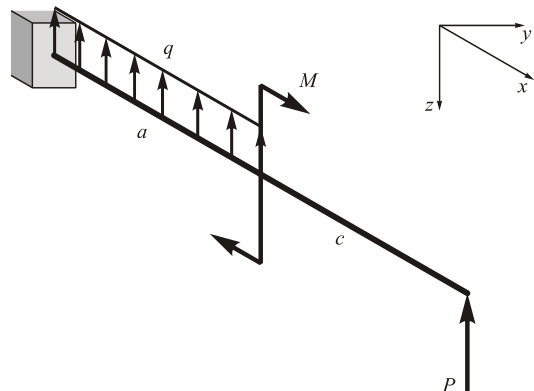   **signature**

  Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 102   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
                                                              signature
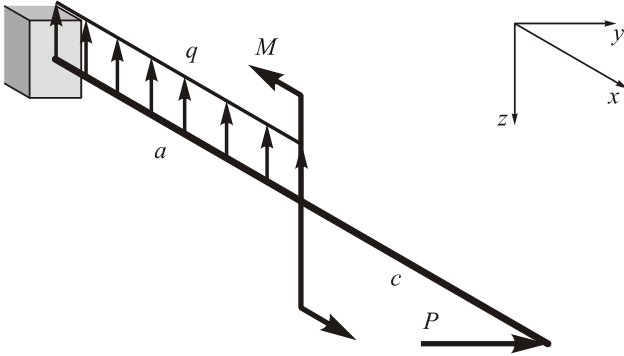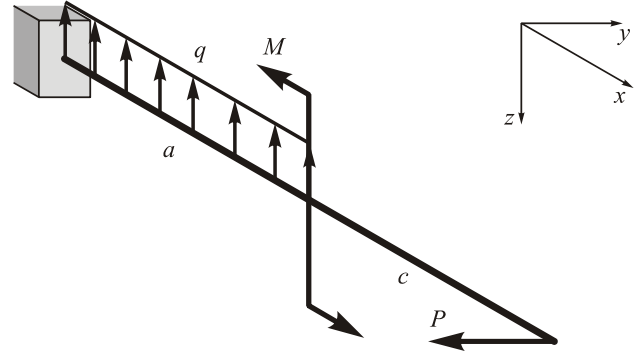
  Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 103   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
                                                              signature
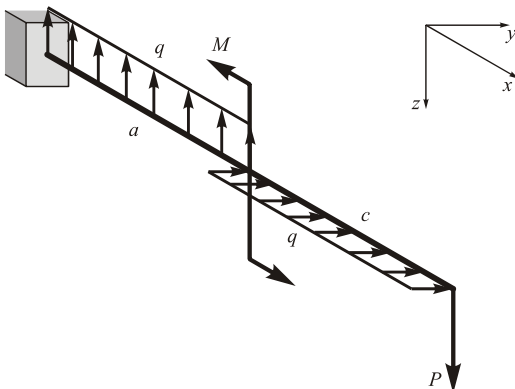
  Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 104   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
                                                              signature
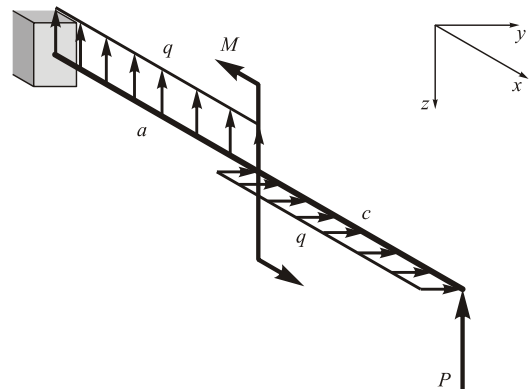
  Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 105 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:

1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
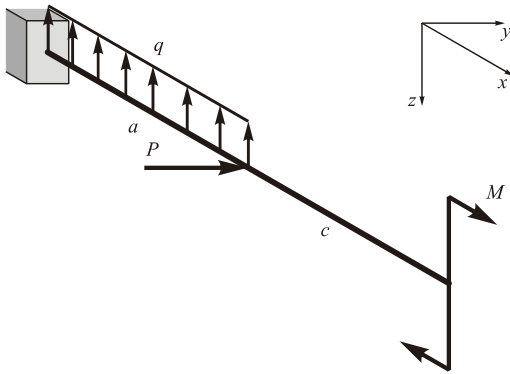
signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 106 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:

1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

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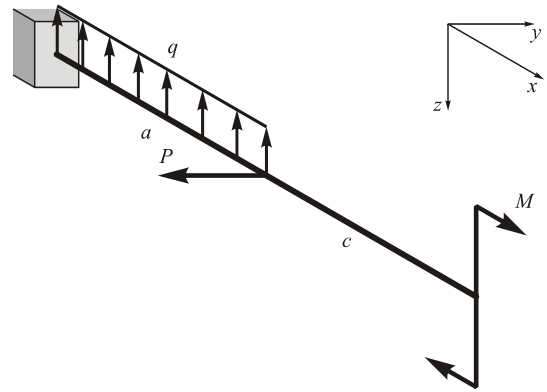
Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 107 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:

1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
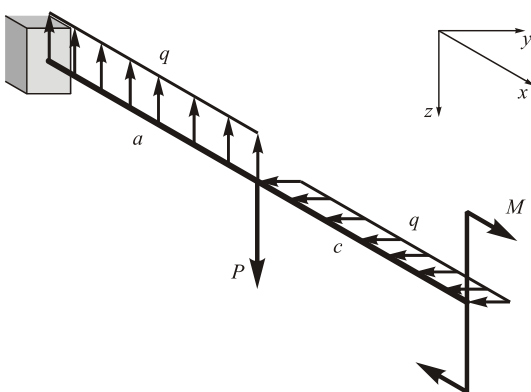
signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 108 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:

1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
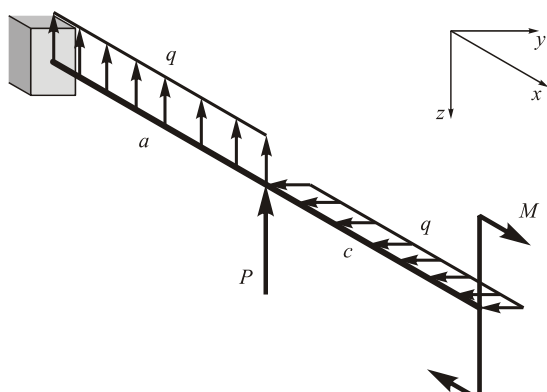
signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 109   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (*h*=20cm, *b*=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

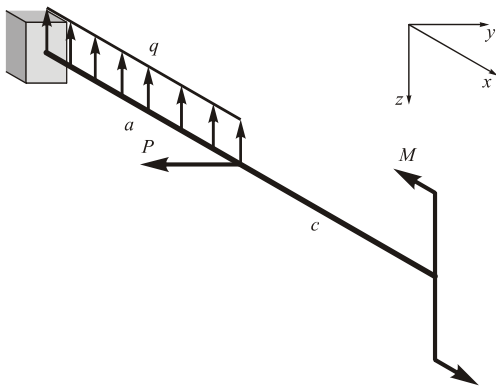   **signature**

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 110   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (*h*=20cm, *b*=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

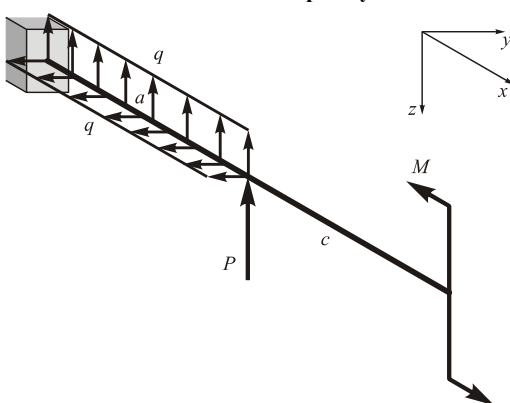   **signature**

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 111   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (*h*=20cm, *b*=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

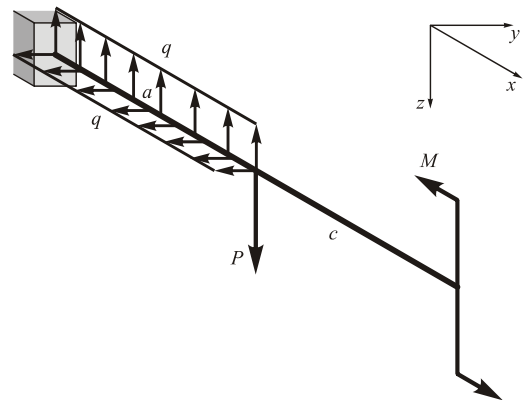   **signature**

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 112   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (*h*=20cm, *b*=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

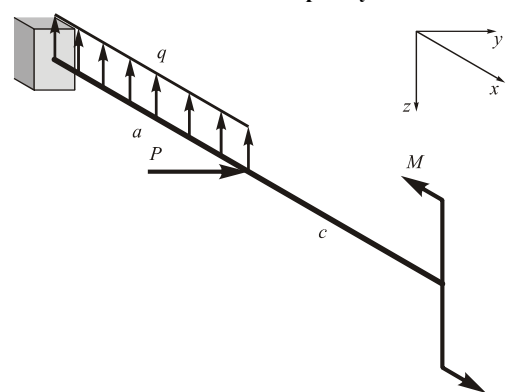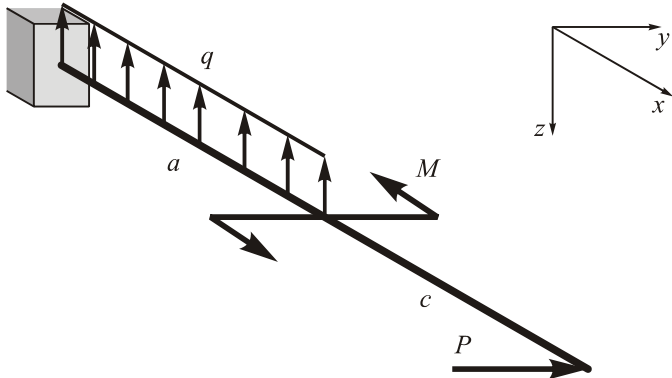   **signature**

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 113 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
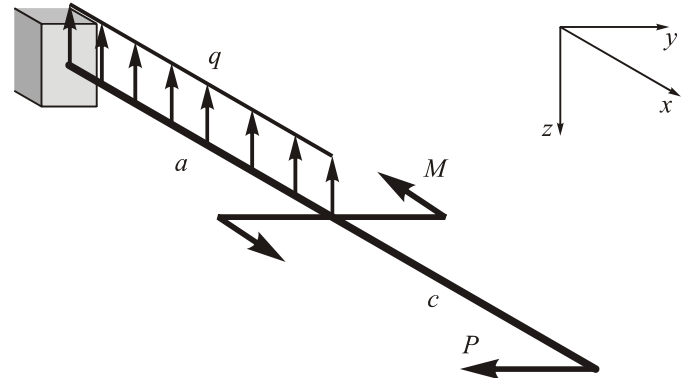
signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 114 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

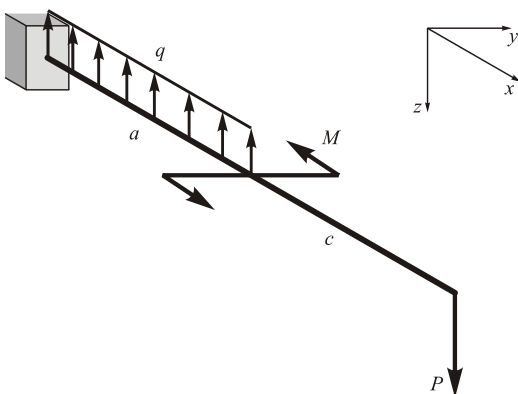**signature**

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 115 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
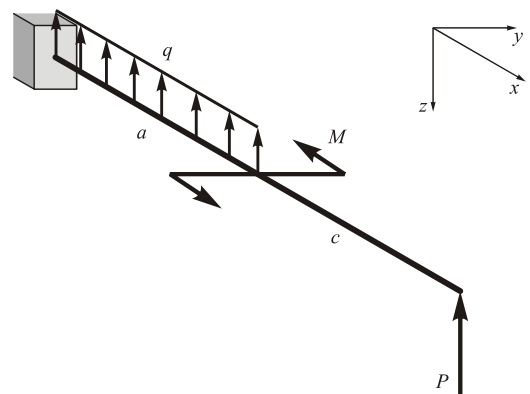
signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 116 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
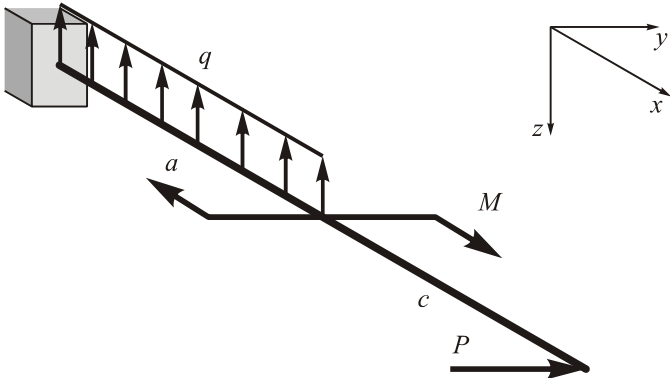
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Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 117   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

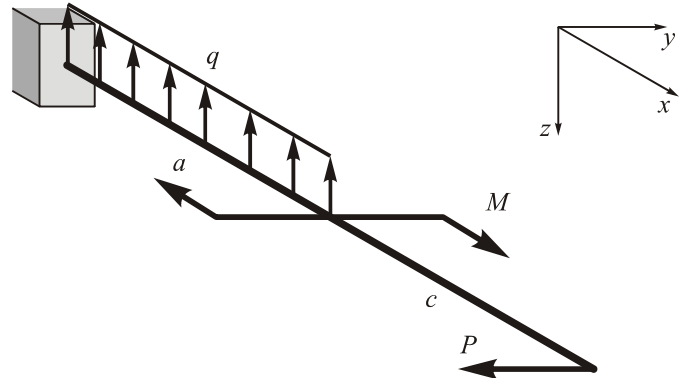   **signature**

  Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 118   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

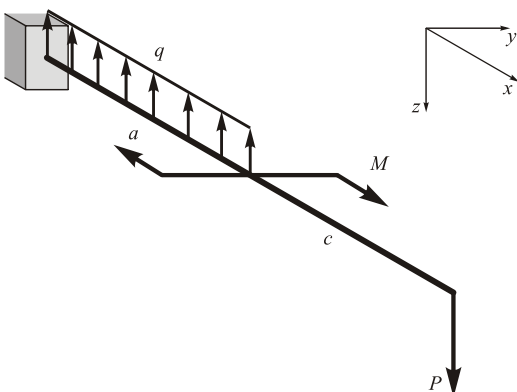   **signature**

  Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 119   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

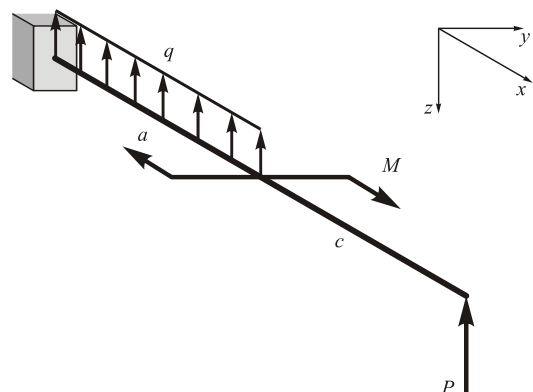   **signature**

  Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 120   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

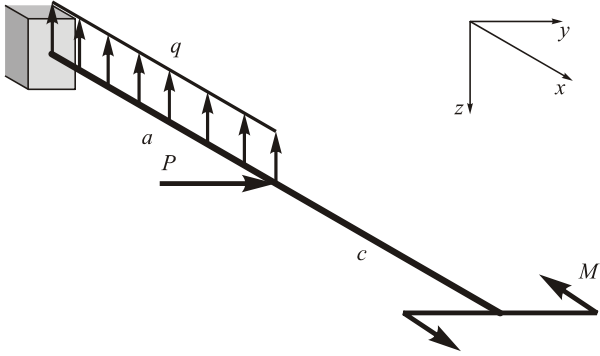   **signature**

  Full name of the lecturer

Mark:

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 121 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.

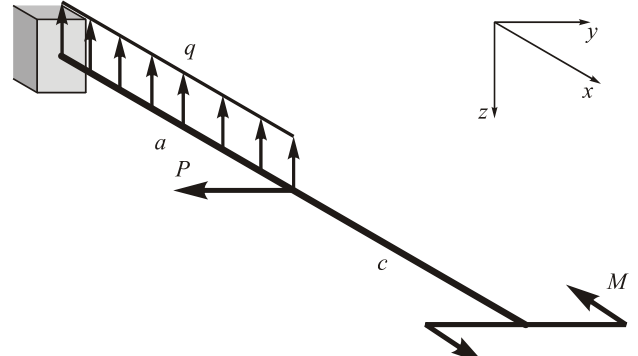signature

Full name of the lecturer

Mark:

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 122 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
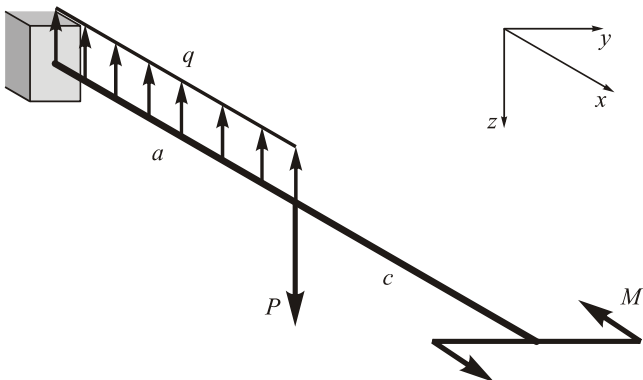
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Full name of the lecturer

Mark:

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 123 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
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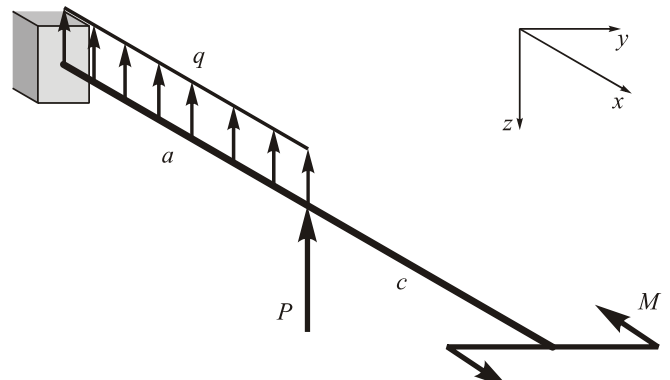signature

Full name of the lecturer

Mark:

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 124 **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;
2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
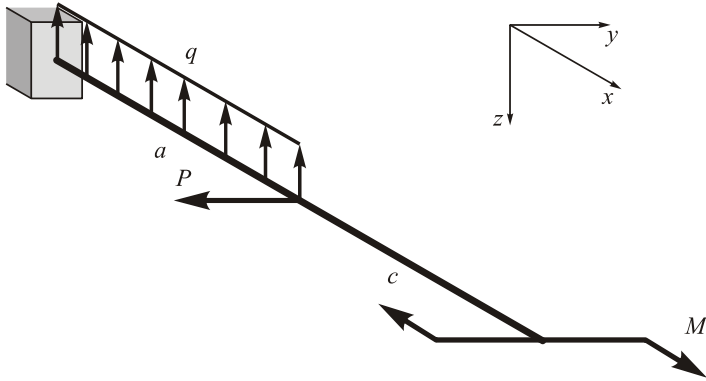
signature

Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 125   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
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                                                                signature
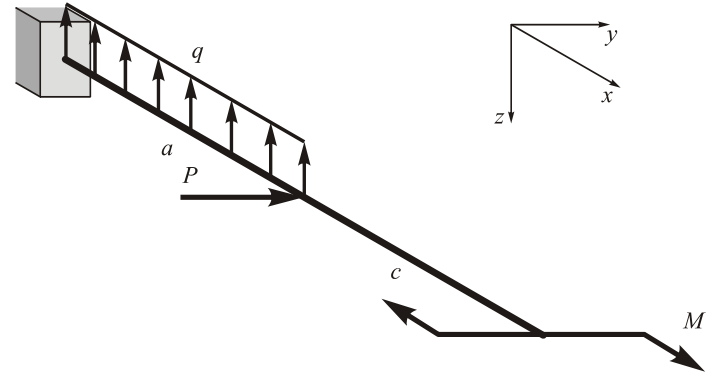**Full name of the lecturer**

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 126   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
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                                                                signature
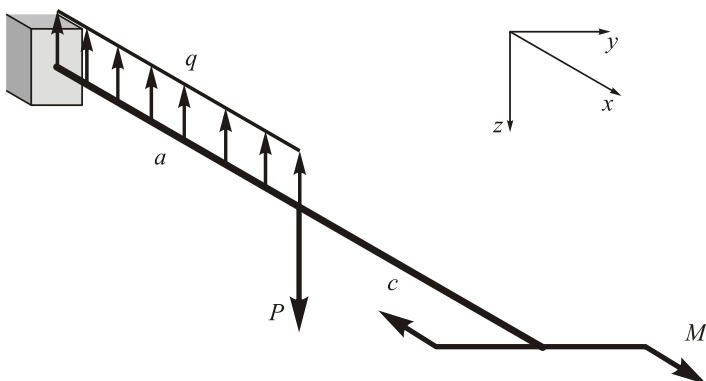**Full name of the lecturer**

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 127   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
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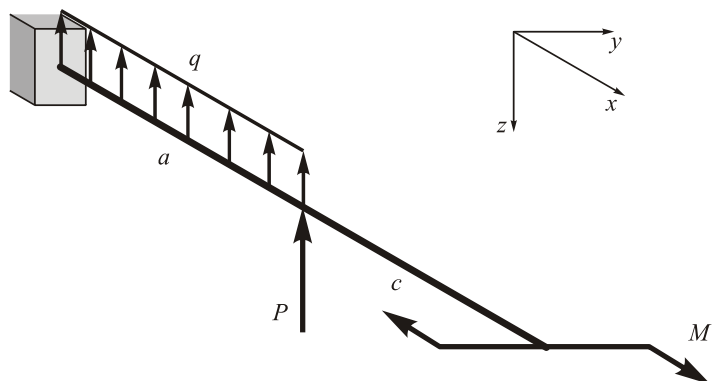**Full name of the lecturer**

Mark:

National aerospace university
"Kharkiv Aviation Institute"
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Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 128   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
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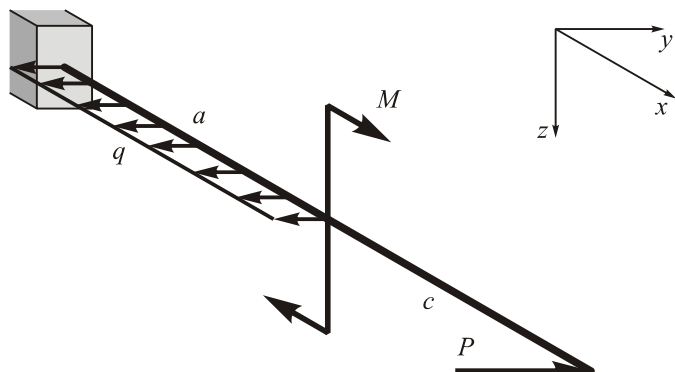**Full name of the lecturer**

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National aerospace university
"Kharkiv Aviation Institute"
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Document: home problem
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Variant: 129   **Complexity: 1**

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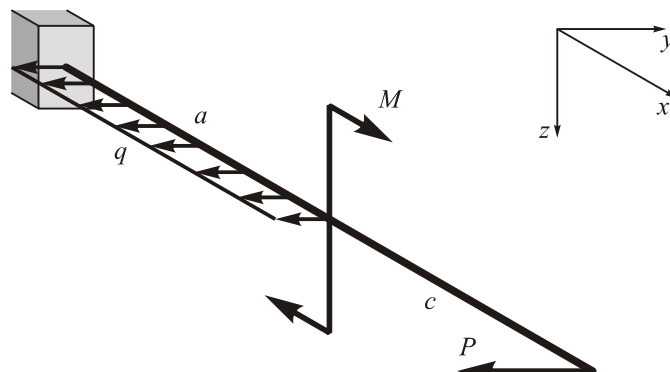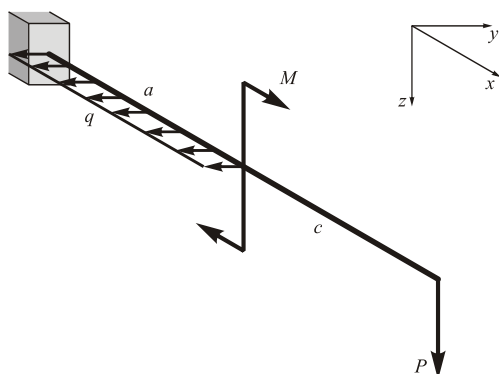
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Subject: mechanics of materials
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Topic: Stress Analysis of the Beam in Oblique Bending.

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Variant: 130   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
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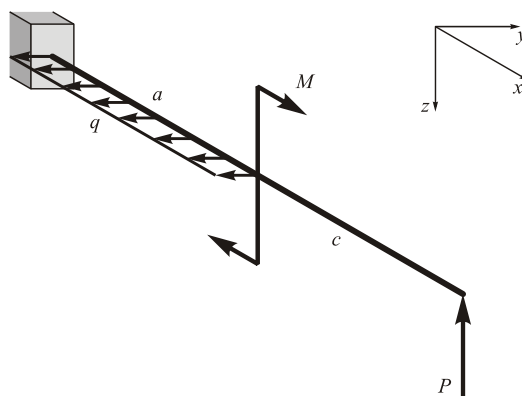**signature**

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Variant: 131   **Complexity: 1**

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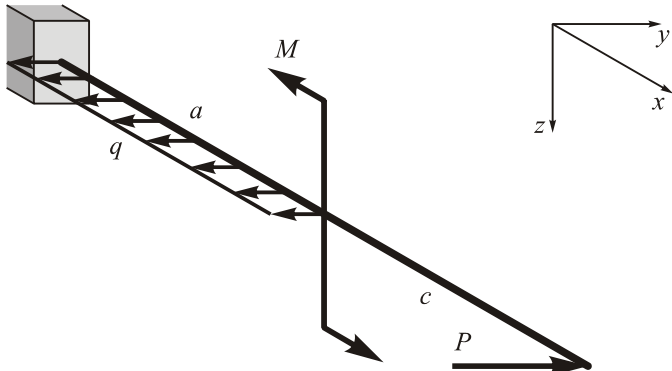
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Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 132   **Complexity: 1**

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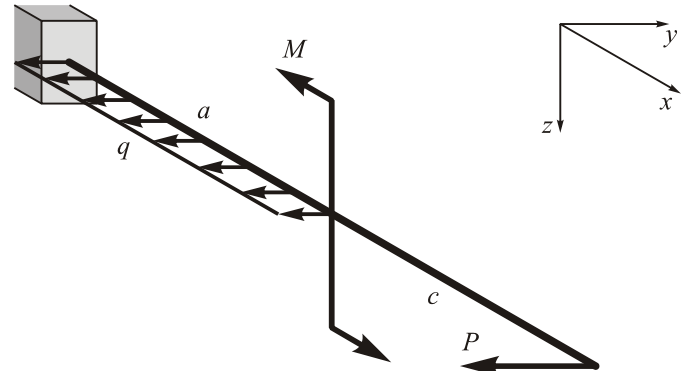
signature

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Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

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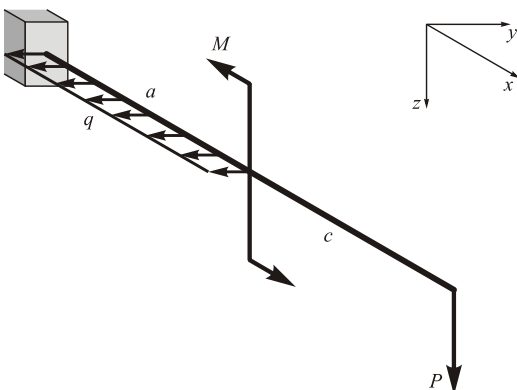   **signature**

 Full name of the lecturer

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National aerospace university
"Kharkiv Aviation Institute"
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Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

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Variant: 134   **Complexity: 1**

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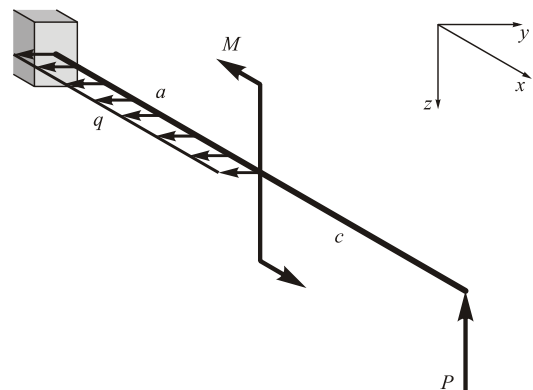   **signature**

 Full name of the lecturer

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 135   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
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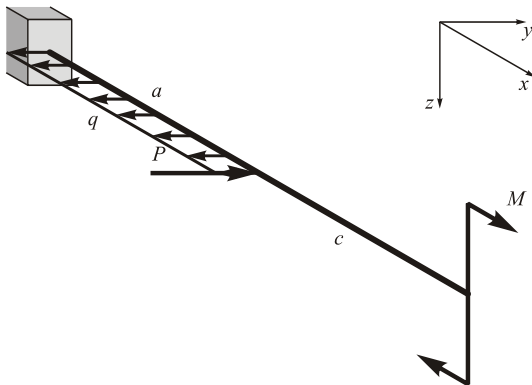   **signature**

 Full name of the lecturer

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 136   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
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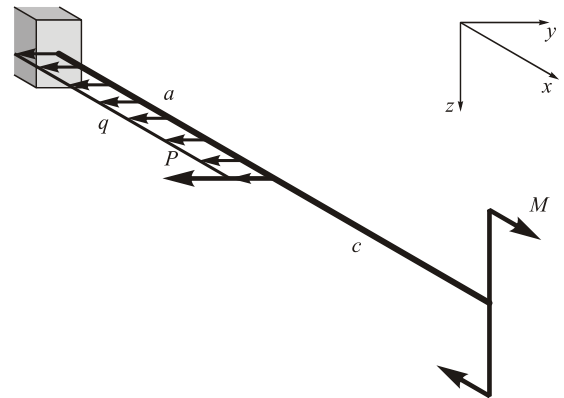   **signature**

 Full name of the lecturer

Mark:

Variant: 137   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

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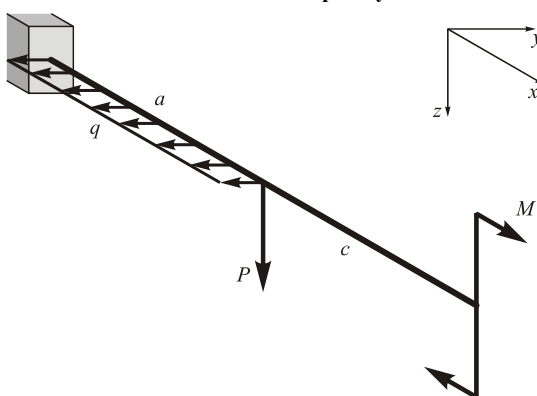
signature

Full name of the lecturer

Mark:

Variant: 138   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

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signature

Full name of the lecturer

Mark:

Variant: 139   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

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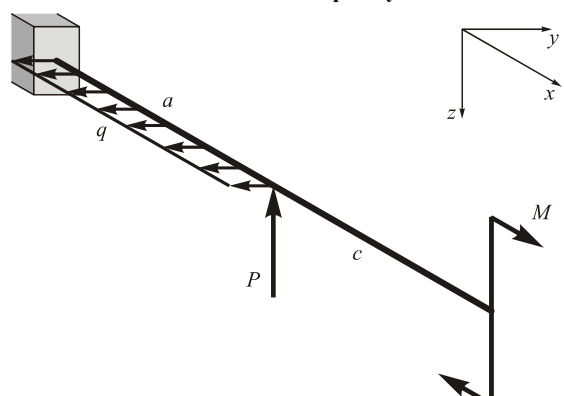
signature

Full name of the lecturer

Mark:

Variant: 140   **Complexity: 1**

Given: $q = 10$ kN/m; $P = 20$ kN; $M = 10$ kNm; $[\sigma] = 160$ MPa; $a = 2$ m, $c = 4$ m. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.

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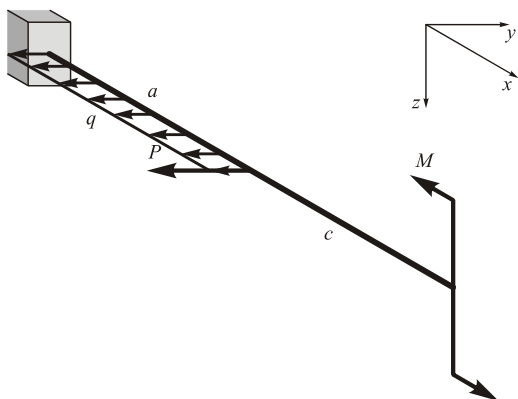
signature

Full name of the lecturer

Mark:

Variant: 141   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
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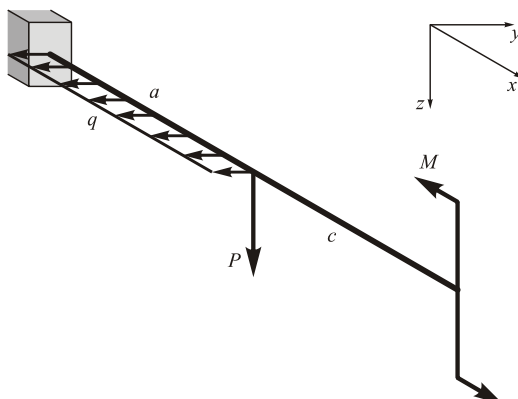   **signature**
 Full name of the lecturer

Mark:

Variant: 142   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
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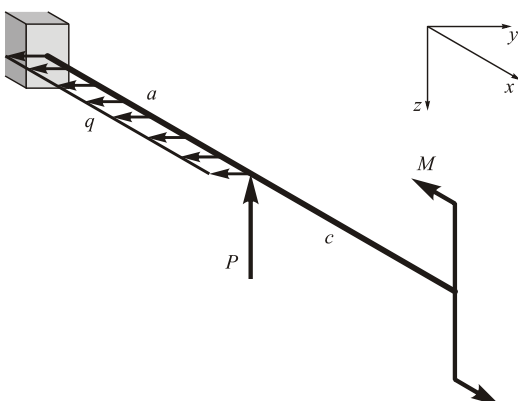 **Full name of the lecturer**

Mark:

Variant: 143   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
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                                                    signature
 Full name of the lecturer

Mark:

Variant: 144   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
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                                                    signature
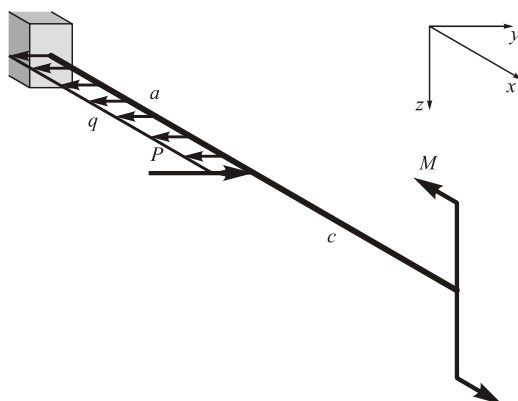 **Full name of the lecturer**

Mark:

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

Subject: mechanics of materials
Document: home problem
Topic: Stress Analysis of the Beam in Oblique Bending.

Full name of the student, group

Variant: 145   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
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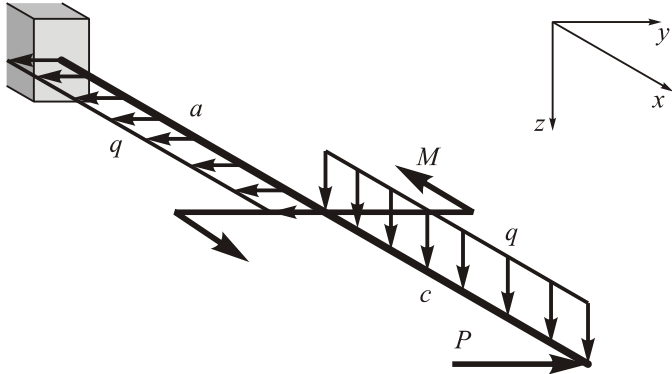 **Full name of the lecturer**

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Department of aircraft strength

Subject: mechanics of materials
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Topic: Stress Analysis of the Beam in Oblique Bending.

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Variant: 146   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
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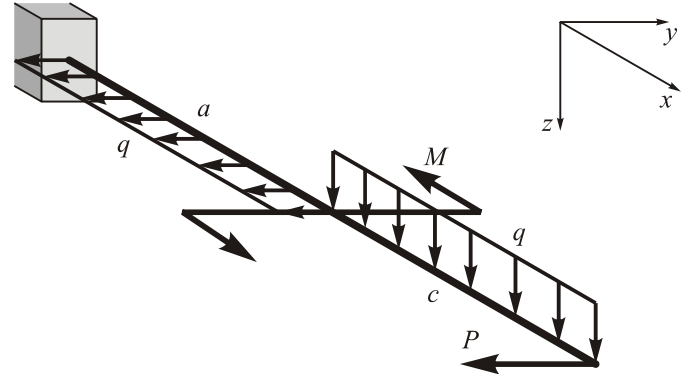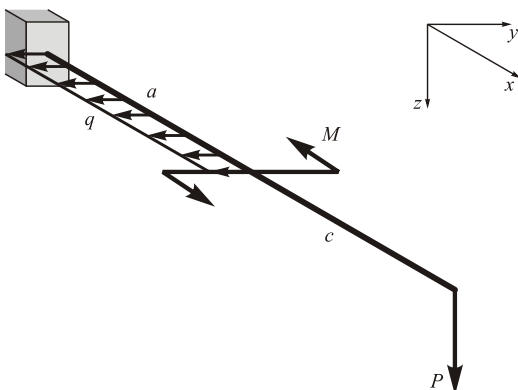 **Full name of the lecturer**

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Variant: 147   **Complexity: 1**

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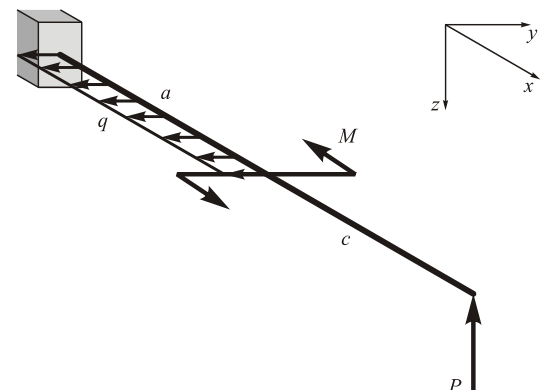 **Full name of the lecturer**

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Topic: Stress Analysis of the Beam in Oblique Bending.

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Variant: 148   **Complexity: 1**

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  Full name of the lecturer

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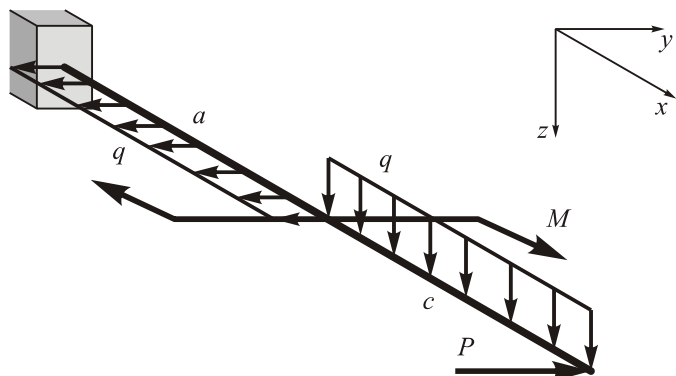**Subject:** mechanics of materials
Document: home problem
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Full name of the student, group

Variant: 149   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
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2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
                                                                    signature
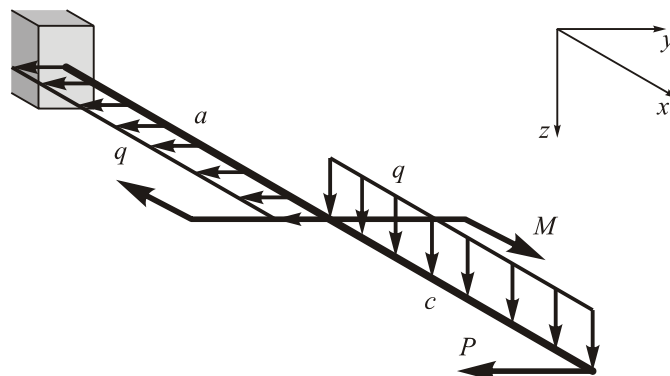
 Full name of the lecturer

Mark:

Variant: 150   **Complexity: 1**

Given: $q = 10\,\text{kN/m}$; $P = 20\,\text{kN}$; $M = 10\,\text{kNm}$; $[\sigma] = 160\,\text{MPa}$; $a = 2\,\text{m}$, $c = 4\,\text{m}$. Cross-section: a) rectangle (h=20cm, b=10cm); b) I-beam №___.
Goal:
1) draw the graphs of bending moments $M_y(x)$ and $M_z(x)$;

2) design the graph of stress distribution in critical cross-section;
3) find critical point in critical section and estimate the strength of the beam;
4) analytically find position of neutral axis in critical cross-section.
                                                                    signature

 Full name of the lecturer

Mark: