

GABARITO

FÍSICA A

Aula 05

	0	1	2	3	4	5	6	7	8	9
0		d	b	c	b	e	c	b	a	*
1	d	*	c	b	d					

01. d
02. b
03. c
04. b
 $M = F \cdot d$
 $144 = 480 \cdot d$
 $d = 0,3 \text{ m}$
05. e
 $M = F_y \cdot d$
 $M = 50 \cdot \text{sen}45^\circ \cdot 2$
 $M = 100 \frac{\sqrt{2}}{2} = 50\sqrt{2} \cong 70,7 \text{ N} \cdot \text{m}$
06. c
 $10^2 = d^2 + 6^2$
 $d = 8 \text{ cm} = 8 \cdot 10^{-2} \text{ m}$
 $M = F \cdot d$
 $M = 1 \cdot 10^{-4} \cdot 8 \cdot 10^{-2}$
 $M = 8 \cdot 10^{-6} \text{ N} \cdot \text{m}$
07. b
08. a
 $|M| = F_y \cdot d$
 $|M| = 10 \cdot \text{sen}30^\circ \cdot 2$
 $M = 10 \text{ N} \cdot \text{m}$
09. $40 \text{ N} \cdot \text{m}$
 $|M| = F_y \cdot d$
 $|M| = 20 \cdot \text{sen}30^\circ \cdot 4$
 $|M| = 40 \text{ N} \cdot \text{m}$
10. d
 $|M| = f \cdot (a + b) - f \cdot b$
 $|M| = f \cdot a + f b - f b$
 $|M| = f \cdot a$
11. $50 \text{ N} \cdot \text{m}$; horário
 $M_R = 30 \cdot 3 + 20 \cdot 2 - 20 \cdot 4$
 $M_R = + 50 \text{ N} \cdot \text{m}$
12. c

13. b

$R \cdot x = 1 \cdot 5 + 5 \cdot 3 + 4 \cdot 0$
 $10 \cdot x = 20$
 $x = 2 \text{ cm}$

14. d

$-R \cdot x = -5 \cdot 4 + 2 \cdot 1$
 $-6 \cdot x = -18$
 $x = 3 \text{ m}$

Aula 06

	0	1	2	3	4	5	6	7	8	9
0		08	d	a	e	b	32	a	a	a
1	*									

01.
 $x_{CM} = \frac{2 \cdot 0 + 8 \cdot 10}{2 + 8}$
 $x_{CM} = 8 \text{ m}$
02. d
 $x_{CG} = \frac{80 \cdot 1 + 1 \cdot 7}{80 + 1}$
 $x_{CG} \cong 1,07 \text{ m}$ e $y_{CG} = 1 \text{ m}$
03. a
 $x_{CM} = \frac{79 \cdot 0 + 1 \cdot 400\,000}{79 + 1}$
 $x_{CM} = 5\,000 \text{ km}$
04. e
-
- $x_{CG} = \frac{2 \cdot (-1) + 3 \cdot 0 + 5 \cdot 1}{2 + 3 + 5}$
 $x_{CG} = \frac{3}{10}$
 $x_{CG} = 0,3 \text{ m}$

05. b

$$x_{CM} = \frac{2 \cdot 3 + 4 \cdot 4 + 2 \cdot 1}{2 + 4 + 2}$$

$$x_{CM} = 3 \text{ m}$$

$$y_{CM} = \frac{2 \cdot 6 + 4 \cdot 4 + 2 \cdot 2}{2 + 4 + 2}$$

$$y_{CM} = 4 \text{ m}$$

CM (3; 4) ⇒ B

06. 32

07. a

$$x_{CM} = \frac{1 \cdot 1 + 3 \cdot 1 + 4 \cdot 11}{1 + 3 + 4}$$

$$x_{CM} = 6$$

$$x_{CM} = \frac{1 \cdot 9 + 3 \cdot 1 + 4 \cdot 9}{1 + 3 + 4}$$

$$y_{CM} = 6$$

CM (6,6) ⇒ A

08. a

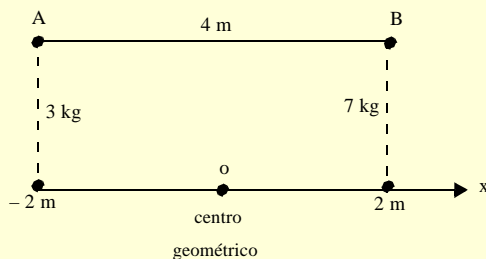
$$x_{CG} = \frac{2 \cdot 0 + 3 \cdot 70 + 8 \cdot 70 + 10 \cdot 0}{2 + 3 + 8 + 10}$$

$$x_{CG} \cong 33,5 \text{ cm}$$

$$y_{CG} = \frac{2 \cdot 70 + 3 \cdot 70 + 8 \cdot 0 + 10 \cdot 0}{2 + 3 + 8 + 10}$$

$$y_{CG} \cong 15,2 \text{ cm}$$

09. a



$$x_{CG} = \frac{3 \cdot (-2) + 7 \cdot 2}{3 + 7}$$

$$x_{CG} = 0,8 \text{ m} \quad \therefore \quad 80 \text{ cm}$$

10.

$$x_{CM} = \frac{m_1 \cdot x_1 + m_2 \cdot x_2}{m_1 + m_2}$$

$$10 = \frac{m_1 \cdot 5 + m_2 \cdot 20}{m_1 + m_2}$$

$$10m_1 + 10m_2 = 5m_1 + 20m_2$$

$$10m_1 - 5m_1 = 20m_2 - 10m_2$$

$$5m_1 = 10m_2$$

$$\frac{m_1}{m_2} = \frac{10}{5}$$

$$\frac{m_1}{m_2} = 2$$

Aula 07

	0	1	2	3	4	5	6	7	8	9
0		d	d	*	d	e	b	*	b	*

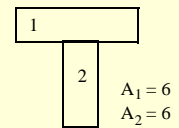
01. d

02. d

$$x_{CG} = 3 \text{ (simetria)}$$

$$y_{CG} = \frac{6 \cdot 3,5 + 6 \cdot 1,5}{6 + 6}$$

$$y_{CG} = 2,5$$



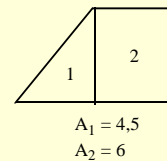
03.

$$x_{CM} = \frac{4,5 \cdot 2 + 6 \cdot 4}{4,5 + 6}$$

$$x_{CM} \cong 3,14$$

$$y_{CM} = \frac{4,5 \cdot 1 + 6 \cdot 1,5}{4,5 + 6}$$

$$y_{CM} \cong 1,29$$



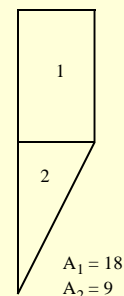
04. d

$$x_{CG} = \frac{18 \cdot 1,5 + 9 \cdot 1}{18 + 9}$$

$$x_{CG} = \frac{4}{3}$$

$$y_{CG} = \frac{18 \cdot 9 + 9 \cdot 4}{18 + 9}$$

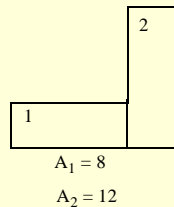
$$y_{CG} = \frac{22}{3}$$



05. e

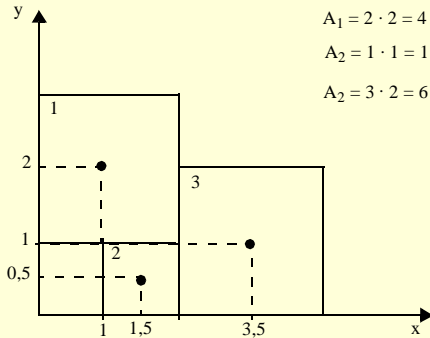
$$x_{CG} = \frac{8 \cdot 2 + 12 \cdot 5}{8 + 12}$$

$$x_{CG} = 3,8 \text{ cm}$$



06. b

07.



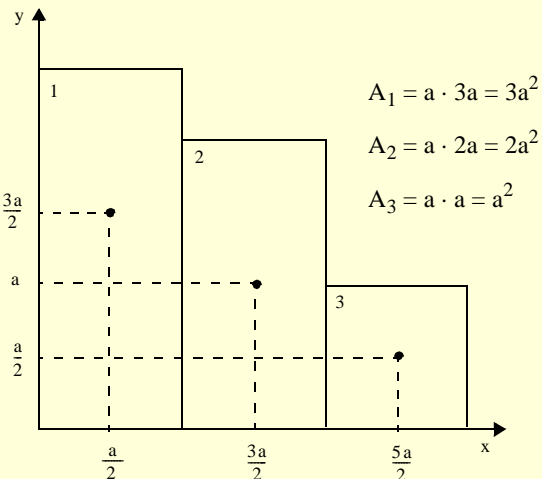
$$x_{CM} = \frac{4 \cdot 1 + 1 \cdot 1,5 + 6 \cdot 3,5}{4 + 1 + 6} = \frac{26,5}{11}$$

$$x_{CM} \cong 2,41$$

$$x_{CM} = \frac{4 \cdot 2 + 1 \cdot 0,5 + 6 \cdot 1}{4 + 1 + 6} = \frac{145}{11}$$

$$y_{CM} \cong 1,32$$

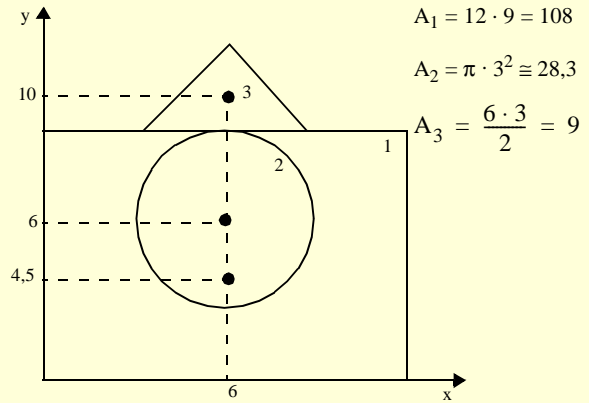
08. b



$$x_{CG} = \frac{3 \cdot a^2 \cdot \frac{a}{2} + 2a^2 \cdot \frac{3a}{2} + a^2 \cdot \frac{5a}{2}}{3a^2 + 2a^2 + a^2} = \frac{7}{6}a$$

$$y_{CG} = \frac{3a^2 \cdot \frac{3a}{2} + 2a^2 \cdot a + a^2 \cdot \frac{a}{2}}{3a^2 + 2a^2 + a^2} = \frac{7}{6}a$$

09.



$$x_{CG} = 6 \text{ (simetria)}$$

$$y_{CG} = \frac{A_1 \cdot y_1 - A_2 \cdot y_2 + A_3 \cdot y_3}{A_1 - A_2 + A_3}$$

$$y_{CG} = \frac{108 \cdot 4,5 - 28,3 \cdot 6 + 9 \cdot 10}{108 - 28,3 + 9}$$

$$y_{CG} \cong 4,58$$

Aula 08

	0	1	2	3	4	5	6	7	8	9
0		d	e	c	c	e	d	08	b	16
1	c	e	05	06	d	c				

01. d

02. e

03. c

04. c

$$F \cdot 0,8 = 500 \cdot 0,2$$

$$F = 125 \text{ N}$$

05. e

$$P_1 \cdot d_1 = P_2 \cdot d_2$$

$$10 \cdot \cancel{g} \cdot d_1 = 6 \cdot \cancel{g} \cdot d_2$$

$$d_1 = \frac{3}{5}d_2$$

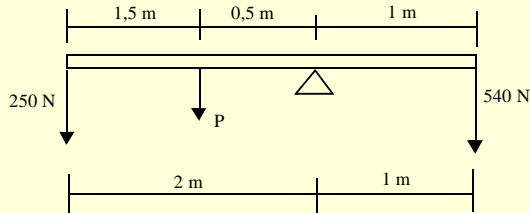
06. d

$$m_1 \cdot g = m_2 \cdot g \cdot y$$

$$m_1 \cdot x = m_2 \cdot 2x$$

$$m_1 = 2m_2$$

07.



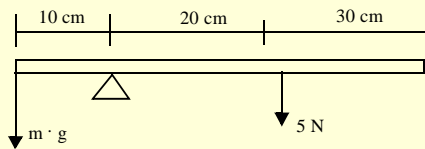
$$250 \cdot 2 + P \cdot 0,5 = 540 \cdot 1$$

$$500 + m \cdot g \cdot 0,5 = 540$$

$$m \cdot 5 = 40$$

$$m = 8 \text{ kg}$$

08. b



$$m \cdot g \cdot 10 = 5 \cdot 20$$

$$m = \frac{100}{100}$$

$$m = 1 \text{ kg}$$

09. 16

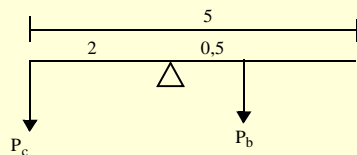
$$30 \cdot g \cdot d = 45 \cdot g \cdot (2,5 - d)$$

$$30d = 112,5 - 45d$$

$$75d = 112,5$$

$$d = 1,5 \text{ m}$$

10. c



$$P_b \cdot 0,5 = P_c \cdot 2$$

$$\frac{P_b}{P_c} = \frac{2}{0,5}$$

$$\frac{P_b}{P_c} = 4$$

11. e

12.

$$m_3 \cdot g \cdot x_3 + m_2 \cdot g \cdot x_2 = m_1 \cdot g \cdot x_1$$

$$2 \cdot x_3 + 3 \cdot 10 = 4 \cdot 10$$

$$x_3 = 5 \text{ m}$$

13.

$$P \cdot l_2 = 9 \cdot l_1$$

$$P \cdot l_1 = 4 \cdot l_2$$

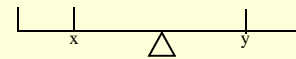
$$\frac{P}{9} = \frac{l_1}{l_2} \quad \frac{l_1}{l_2} = \frac{4}{P}$$

$$\frac{P}{9} = \frac{4}{P}$$

$$P^2 = 36$$

$$\therefore P = 6 \text{ kgf}$$

14. d



$$m_e \cdot x = m \cdot y$$

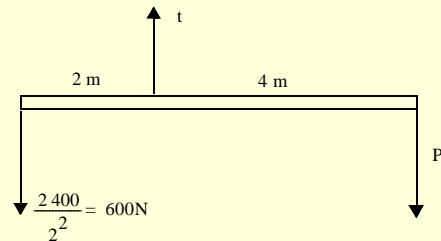
$$m \cdot x = m_d \cdot x$$

$$\frac{x}{y} = \frac{m}{m_e} \quad \frac{x}{y} = \frac{m_d}{m}$$

$$\frac{m}{m_e} = \frac{m_d}{m}$$

$$m^2 = m_e \cdot m_d \quad \therefore m = \sqrt{m_e \cdot m_d}$$

15. c



$$P \cdot 4 = 600 \cdot 2$$

$$P = 300 \text{ N}$$

$$T = 600 + 300$$

$$\therefore T = 900$$

Testes complementares

	0	1	2	3	4	5	6	7	8	9
0		d	d	e	*	*	*	e	d	a

01. d

$$M_1 = M_2$$

$$P_1 \cdot d_1 = P_2 \cdot d_2$$

como: $d_1 > d_2$

Então: $P_1 < P_2$

02. d

03. e

04. a. $1\ 200 \cdot d = F \cdot (L - d)$

$$1\ 200 \cdot d = 200 \cdot (L - d)$$

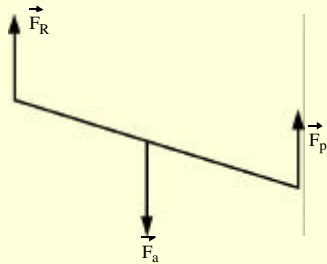
$$6d = L - d$$

$$7d = L$$

$$\frac{d}{L} = \frac{1}{7}$$

b. $R = 1\ 200 + 200 = 1\ 400\text{N}$

05. a.



\vec{F}_p = força exercida pela pessoa no abridor

\vec{F}_a = força exercida pela tampa no abridor

\vec{F}_R = força de reação da tampa no abridor

b. $F_p \cdot (7 + 1,4) = F_a \cdot 1,4$

$$\frac{F_p}{F_a} = \frac{1,4}{8,4}$$

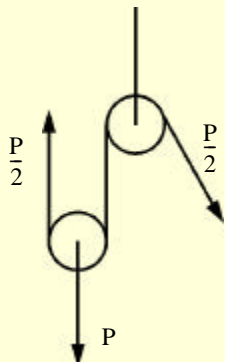
$$\frac{F_p}{F_a} = \frac{1}{6}$$

06. $P_R \cdot d_R = P_C \cdot d_C$

$$240\text{ g} \cdot \frac{80}{2} = m_c \cdot g \cdot \frac{60}{2}$$

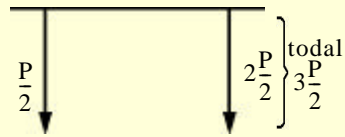
$$m_c = 320\text{ kg}$$

07.



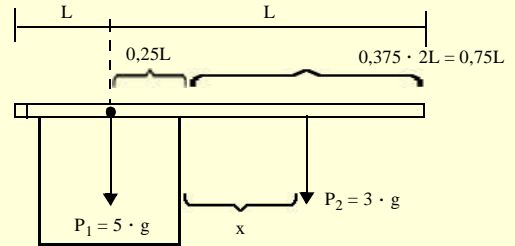
I. Falsa, o peso não muda.

II. Verdadeira



III. Verdadeira

08. c



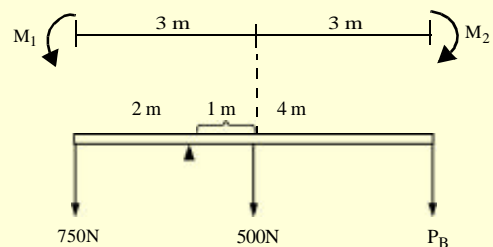
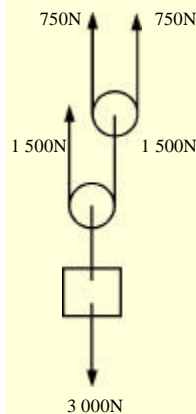
$$M_1 = M_2$$

$$P_1 \cdot x_1 = P_2 \cdot x_2$$

$$5 \cdot g \cdot 0,25L = 3 \cdot g \cdot x$$

$$x \cong 0,417L$$

09. a



$$M^o_1 = M^o_2$$

$$750 \cdot 2 = 500 \cdot 1 + P_B \cdot 4$$

$$1\ 500 - 500 = P_B \cdot 4$$

$$P_B = 250\text{ N}$$