GABARITO

FÍSICA A

Aula 09

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

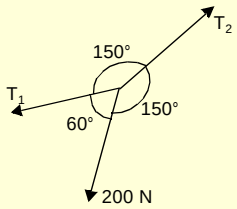
01. e
$P = m \cdot g$
$P = 20 \cdot 5$
$P = 100\ N$

02. b

03. b
$F = k \cdot x$
$20 = k \cdot 0{,}01$
$k = 2 \cdot 10^3\ N/m$

04. d
$F^2 = Fx^2 + Fy^2$
$F^2 = 6^2 + 8^2$
$\therefore F = 10\ N$

05. b
$R^2 = F_1^2 + F_2^2 + 2 \cdot F_1 \cdot F_2 \cdot \cos\alpha$
$R^2 = 1^2 + 1^2 + 2 \cdot 1 \cdot 1 \cos 60°$
$R \cong 1{,}73\ N$
$|e| = |1{,}73 - 1{,}60|$
$|e| = 0{,}13\ N$

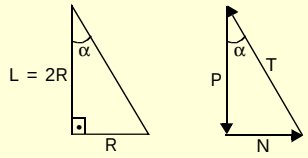
06.


$$\frac{T_1}{\text{sen } 150°} = \frac{200}{\text{sen } 150°}$$
$\therefore T_1 = 200\ N$

$$\frac{T_2}{\text{sen } 60°} = \frac{200}{\text{sen } 150°}$$

$$\frac{T_2}{\frac{\sqrt{3}}{2}} = \frac{200}{\frac{1}{2}}$$

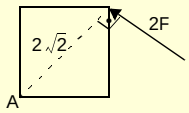
$\therefore T_2 = 200\sqrt{3}\ N$

07. c


$$tg\alpha = \frac{R}{2R} = \frac{1}{2} \qquad tg\ \alpha = \frac{N}{P}$$

$$\therefore \frac{N}{P} = \frac{1}{2} = 0{,}5$$

08. d

09. d


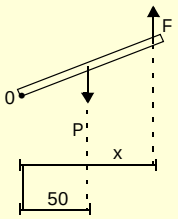
$\therefore M_A = 2F \cdot 2\sqrt{2}$
$M_A = 4F\sqrt{2}$

10. $x_{CG} = \frac{P \cdot 1 + P \cdot 3 + P \cdot 4}{P + P + P} \cong 2{,}67$

$y_{CA} = \frac{P \cdot 3 + P \cdot 2 + P \cdot 1}{P + P + P} = 2$

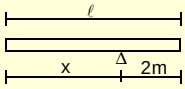
11. $x_{CM} = \frac{2 \cdot 8 - 3 \cdot 1}{8 - 1} = \frac{13}{7}$
$x_{CM} \cong 1{,}86\ cm$
$y_{CM} = \frac{1 \cdot 8 - 1 \cdot 1}{8 - 1} = \frac{7}{7}$
$y_{CM} = 1$

$A_1 = 4 \times 2 = 8m^2$
$A_2 = 1 \times 1 = 1m^2$
retângulo: (2; 1)
quadrado: (3; 1)

12. c


$F \cdot x = P \cdot 50$
$25 \cdot x = 40 \cdot 50$
$x = 80{,}0\ cm$

13. $F_1 \cdot x = F_2 \cdot 2$
$5 \cdot x = 30 \cdot 2$
$x = 12$
$\therefore \ell = 12 + 2 = 14\ m$



Aula 10

	0	1	2	3	4	5	6	7	8	9
0		e	e	*	b	e	e	*	11	b
1	e	c	b							

01. e
$R_B \cdot 1{,}5 = 900 \cdot 0{,}5$
$R_B = 300\ N$

02. e
$5 \cdot R_A = 200 \cdot 4 + 100 \cdot 4{,}5$
$R_A = 250\ N$

03. $R_A \cdot 10 = 10 \cdot 9 + 20 \cdot 7 + 40 \cdot 3$
$R_A = 35\ N$
$\therefore R_B = 70 - 35 = 35\ N$

04. b
$R_A \cdot 3 = 150 \cdot 1$
$R_A = 50\ N$
$\therefore R_B = 150 - 50 = 100N$

05. e

$T_C \cdot 1 = 4{,}8 \times 10^2 \cdot 0{,}75 + 7 \times 10^2 \cdot 0{,}4$

$T_C = 6{,}4 \times 10^2$ N

$\therefore T_M = 11{,}8 \times 10^2 - 6{,}4 \times 10^2 = 5{,}4 \times 10^2$ N

06. e

$T_A \cdot 100 = 60 \cdot 80 + 50 \cdot 50$

$T_A = 73$ N

07. $R_A \cdot 2 = 50 \cdot 1 + 800 \cdot 0{,}5$

$R_A = 225$ N

$\therefore T = 850 - 225 = 625$ N

08. 11

$R_A \,.\, L = 200 \cdot \frac{L}{2} + 300 \cdot \frac{L}{4}$

$R_A = 175$ N

$\therefore RB = 500 - 175 = 325$ N

09. b

$400 \cdot 1 = F \cdot 0{,}75$

$F \cong 533$ N

10. e

$600 \cdot (x - 4) = 900 \cdot 1$

$600x - 2400 = 900$

$x = 5{,}5$ m

11. c

$R_A \cdot 8 = 10 \cdot 10 + 20 \cdot 5$

$R_A = 25$ kgf

$R_B = 30 - 25 = 5$ kgf

12. b

$\frac{2}{2^2} = \frac{1}{2}$ N

Aula 11

	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
0		e	b	68	c	e	c	*	d	a
1	c	c	c	b	b	*				

01. e

02. b

03. 68

64 + 4

04. c

05. e

Ação e reação têm a mesma intensidade.

06. c

$F = m \cdot a$

$F' = \frac{m}{2} \cdot 4a = 2\,ma$

$\therefore F' = 2F$

07. $v_0 = 36$ km/h $= 10$ m/s

$v = v_0 + a \cdot t$

$0 = 10 + a \cdot 5$

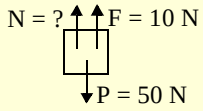
$a = -2$ m/s^2

$\therefore |a| = 2$ m/s^2

$F = m \cdot a$

$F = 30 \cdot 2 =$ **60 N**

08. d



$N + F = P$

$N + 10 = 50$

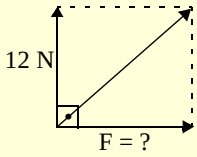
$N = 40$ N

09. a

$R = m \cdot a$

$R = 5 \cdot 3$

$R = 15$ N $\therefore$



$R^2 = F^2 + 12^2$

$15^2 = F^2 + 12^2$

$\therefore F = 9$ N

10. c

$\frac{F}{a} = \text{cte} = m$

$\therefore m = \frac{10}{2} = \frac{20}{4} = \frac{30}{6} = 5$ kg

11. c

12. c

I. $P = m \cdot g = 0{,}6 \cdot 10 = 6$ N

II. Normal

III. Peso e normal não são exemplos de ação e reação.

13. b

Ação e reação atuam em corpos diferentes.

14. b

Como as forças de ação e reação têm módulos iguais, o planeta P, que tem massa maior, terá aceleração menor.

$F = m\uparrow \cdot a\downarrow$

15. $F = m \cdot a$

$45 = 5 \cdot a$

$a = 9$ m/s^2

Se: $v_0 = 0$

$\Delta x = 8$m

então: $v^2 = v_0^2 + 2a\,\Delta x$

$v^2 = 0^2 + 2 \cdot 9 \cdot 8$

$v = \sqrt{144} = 12$ m/s

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

01. e

$R = m \cdot a$

$F = (m_A + m_B) \cdot a$

$21 = (5 + 2) \cdot a$

$a = 3\ m/s^2$

$\therefore\ f = m_B \cdot a$

$f = 2 \cdot 3 = 6\ N$

02. c

$R = m \cdot a$

$10 = (2 + 6 + 12) \cdot a$

$a = 0{,}5\ m/s^2$

$\therefore\ f = m_C \cdot a$

$f = 12 \cdot 0{,}5 = 6\ N$

03. d

$R = m \cdot a$

$f = (3 + 3 + 3) \cdot 2$

$f = 18\ N$

04. $R = m \cdot a$

$36 - 6 = 3 \cdot a$

$a = 10\ m/s^2$

05. e

$R = m \cdot a$

$150 = (4 + 6 + 5) \cdot a$

$a = 10\ m/s^2$

$T_1 = m_A \cdot a$

$\therefore\ T_1 = 4 \cdot 10 = 40\ N$

$T_2 - T_1 = m_B \cdot a$

$T_2 - 40 = 6 \cdot 10$

$\therefore\ T_2 = 100\ N$

06. c

$R = m \cdot a$

$15 = (2 + 3) \cdot a$

$a = 3\ m/s^2$

$f = m_B \cdot a$

$f = 3 \cdot 3 = 9{,}0\ N$

07. b

$R = m \cdot a$

$4 = (3 + 5) \cdot a$

$a = 0{,}5\ m/s^2$

$f = 5 \cdot 0{,}5$

$f = 2{,}5\ N$

08. e

$R = m \cdot a$

$F = (2 + 1) \cdot 4 = 12\ N$

$\therefore\ F = m_{II} \cdot a$

$12 = 1 \cdot a$

$a = 12\ m/s^2$

09. a. $R = m \cdot a$

$P_B = (m_A + m_B) \cdot a$

$20 = (3 + 2) \cdot a$

$a = 4\ m/s^2$

b. $T = m_A \cdot a$

$T = 3 \cdot 4$

$T = 12\ N$

10. a

$R = m \cdot a$

$P_C = (m_A + m_B + m_C) \cdot a$

$30 = (3 + 3 + 3) \cdot a$

$a = \frac{10}{3}\ m/s^2$

$\therefore\ T = m_A \cdot a$

$T = 3 \cdot \frac{10}{3}$

$T = 10\ N$

11. a

$T = P_1 = P_2 = 10\ kgf = 100\ N$

12. d

$R = m \cdot a$

$P_B = (m_A + m_B + m_C) \cdot a$

$300 = (20 + 30 + 10) \cdot a$

$a = 5\ m/s^2$

$f = m_C \cdot a$

$f = 10 \cdot 5$

$f = 50\ N$

13. $R = m \cdot a$

$30M - 10M = (3M + M) \cdot a$

$a = \frac{20M}{4M} = 5\ m/s^2$

14. d

$R = m \cdot a$

$P_A - P_B = (m_A + m_B) \cdot a$

$20m - 10m = (2m + m) \cdot a$

$a = \frac{10}{3}\ m/s^2$

$T_1 - P_B = m_B \cdot a$

$T_1 - 10m = m \cdot \frac{10}{3}$

$T_1 = \frac{40}{3} m$

e $T_2 = 2T_1 = \frac{80}{3} m$

15. $R = m \cdot a$

$147 - 73{,}5 = (7{,}5 + 15) \cdot a$

$a = \frac{49}{15}\ m/s^2$

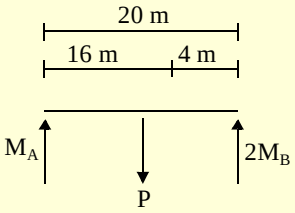
$T - 73{,}5 = 7{,}5 \cdot \frac{49}{15}$

$T = 98\ N$

Testes complementares

	0	1	2	3	4	5	6	7	8	9
0		c	d	28	e	*	e	d	e	b
1	*									

01. c



$M_A \cdot 20 = P \cdot 4$ $\qquad 2M_B \cdot 20 = P \cdot 16$

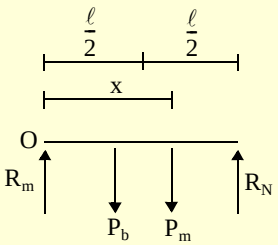
$M_A \cdot 5 = P$ $\qquad \frac{40 \cdot M_B}{16} = P$

$M_A \cdot 5 = \frac{40 \cdot M_B}{16}$

$M_A \cdot 80 = 40 \cdot M$

$M_A = \frac{M_B}{2}$ Logo, a única alternativa compatível é a "c".

02. d



P_b = peso da barra
P_m = peso do menino

$R_N \cdot \ell = P_m \cdot x + P_b \cdot \frac{\ell}{2}$

$R_N = \frac{P_m}{\ell} \cdot x + \frac{P_b}{2}$

↓ equivale a

$y = a \cdot x + b$

(função do 1º grau → reta)

03. 04 + 08 + 16 = 28
01. Falsa: independe da massa.
02. Falsa: corpos diferentes.
32. Falsa: não é necessária a ação de uma força.

04. e

05. a. $R = T_1 \cdot \cos 30^o + T_2 \cdot \cos 30^o$

$R = 10\,000 \cdot \frac{\sqrt{3}}{2} + 10\,000 \cdot \frac{\sqrt{3}}{2}$

$R \cong 17\,320$ N

Logo: $R = m \cdot a$

$17\,320 = 1\,000\,000 \cdot a$

Módulo: $a \cong 0{,}017$ m/s²

direção: AB

sentido: de A para B

b. Sentido oposto da resultante, portanto:
Módulo: $F \cong 17\,320$ N
Direção: AB
Sentido: de B para A

06. e

$R = m \cdot a = m \cdot \left|\frac{\Delta v}{\Delta t}\right| = 10\,000 \cdot \frac{10}{5}$

$R = 20\,000$ N $= 2 \cdot 10^4$ N

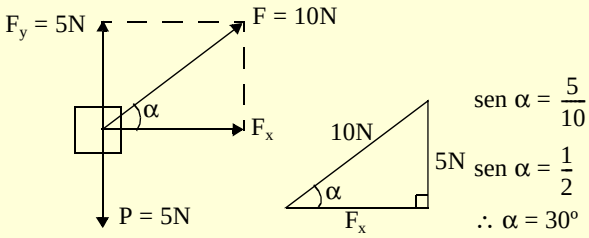
Onde: 10 t = 10 000 kg

36 km/h = 10 m/s

07. d

No instante em que o bloco perde contato com o plano o componente F_y tem módulo igual ao peso do bloco.

$P = m \cdot g = 0{,}5 \cdot 10 = 5$ N



$\cos \alpha = \frac{F_x}{10}$

$\cos 30^o = \frac{F_x}{10}$ $\qquad R = m \cdot a$

$F_x = m \cdot a$

$8{,}66 = 0{,}5 \cdot a$

$a \cong 17{,}3$ m/s²

$\frac{\sqrt{3}}{2} = \frac{Fx}{10}$

$F_x \cong 8{,}66$ N

08. e

Ação e reação

09. b

Velocidade constante, após a ação da força:

$v = \frac{\Delta x}{\Delta t} = \frac{15}{5} = 3$ m/s

Durante a ação da força:

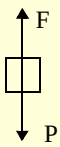
$a = \frac{\Delta v}{\Delta t} = \frac{3-0}{10} = 0{,}3$ m/s²

$F = m \cdot a = 12 \cdot 0{,}3 =$ 3, 6 N

$x = x_0 + v_0 \cdot t + \frac{1}{2} at^2$

$\therefore \Delta x = \frac{1}{2} at^2 = \frac{1}{2} \cdot 0{,}3 \cdot 10^2 =$ 15 m

10. a.



$P = m \cdot g = 500 \cdot 10 = 5\,000$ N

$R = m \cdot a$

$F - P = m \cdot a$

$F - 5\,000 = 500 \cdot 0{,}5$

F = 5 250 N

b. $R = m \cdot a$

$F - P = m \cdot a$; onde P = peso total = massa total. g; porém **m** é a massa do bloco que está sendo acelerado.

$F - 1\,500 \cdot 10 = 500 \cdot 0{,}5$

F = 15 250 N