FÍSICA A

Aula 01

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

01. d

02. a
Força peso

03. b

04. c
$P = m \cdot g$
$640 = m \cdot 10$
$m = 64$ kg

05. d
$F = k \cdot x$
$10 = k \cdot 2$
$k = 5$ N/cm
$\therefore F = 5x$

06. d

07. a
$F = k \cdot x$
$F = 80 \cdot 0{,}01$
$F = 0{,}8$ N

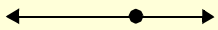
08. d
$8 - 6 \leq R \leq 6 + 8$
$2\text{ N} \leq R \leq 14\text{ N}$

09. a
$R^2 = 50^2 + 120^2$
$R = 130$ N

10. b
$R^2 = 2^2 + 3^2 + 2 \cdot 2 \cdot 3 \cdot \cos 60°$
$R = \sqrt{19}$ N

11. c
$R^2 = 9^2 + 12^2 + 2 \cdot 9 \cdot 12 \cdot \cos 120°$
$R = 11$ N

12. 150 N
$F3 = 350$ N $F_{1,2} = 200$ N



$\therefore R = 350 - 200$
$R = 150$ N

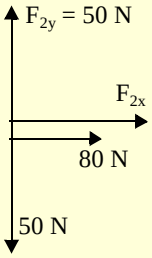
Aula 02

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

01. a
$F_x = F \cdot \cos \theta$
$F_x = 50 \cdot 0{,}6$
$F_x = 30$ N

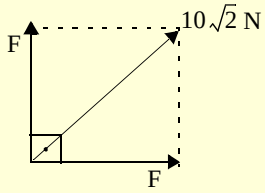
02. e
$F_x = 10 \cdot \cos 60°$ $F_y = 10 \cdot \text{sen } 60°$
$F_x = 10 \cdot 0{,}5$ $F_y = 10 \cdot 0{,}86$
$F_x = 5$ N $F_y = 8{,}6$ N

03. d
$F_{2x} = 100 \cdot \cos 30° = 87$ N
$F_{2y} = 100 \cdot \text{sen } 30° = 50$ N



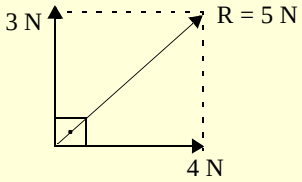
R = 167 N, para direita

04. a

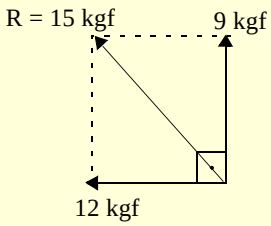


$(10\sqrt{2})^2 = F^2 + F^2$
$\vdots$
$F = 10$ N

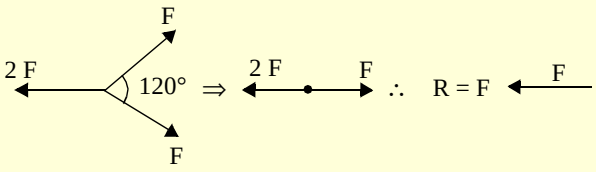
05. b



06. b



07. c

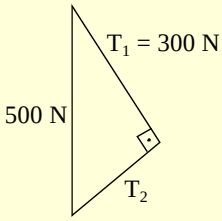


Aula 03

	0	1	2	3	4	5	6	7	8	9
0		c	b	53	c	d	d	e	b	c
1	*									

01. c

02. b

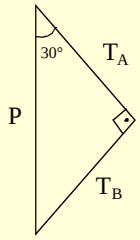


$\therefore \quad T_2 = 400\ N = 4{,}0 \times 10^2\ N$

03. 53

01 + 04 + 16 + 32

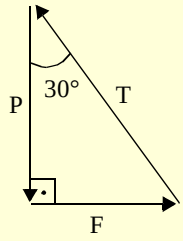
04. c



$\cos 30° = \frac{T_A}{P} \qquad \text{sen } 30° = \frac{T_B}{P}$

$T_A = \frac{P\sqrt{3}}{2} \qquad T_B = \frac{P}{2}$

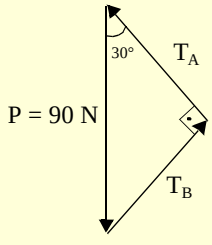
05. d



$\text{sen } 30° = \frac{F}{T}$

$\therefore F = T \cdot \text{sen } 30°$

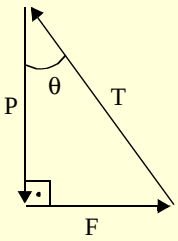
06. d



$\cos 30° = \frac{T_A}{90} \qquad \text{sen } 30° = \frac{T_B}{90}$

$T_A = 45\sqrt{3} \qquad T_B = 45\ N$

07. e



$\text{tg } \theta = \frac{F}{P}$

$\therefore F = P \cdot \text{tg } \theta$

08. b

09. c

$\frac{T}{4} = \frac{P}{3}$

$\frac{T}{4} = \frac{300}{3}$

$T = 400\ N$

10. $\frac{F}{4} = \frac{P}{3}$

$F = \frac{4}{3}\ Mg$

Aula 04

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

01. d

02. b

03. e

$\frac{f_1}{\text{sen } 90°} = \frac{20}{\text{sen } 135°}$

$f_1 = 20\sqrt{2}\ N$

$\frac{f_2}{\text{sen } 135°} = \frac{20}{\text{sen } 135°}$

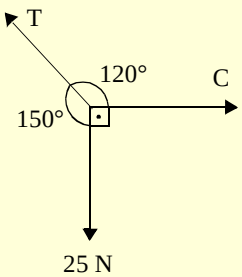
$f_2 = 20\ N$

04. d

$\frac{F}{\text{sen } 135°} = \frac{P}{\text{sen } 135°}$

$F = P$

05.



$\frac{T}{\text{sen } 90°} = \frac{25}{\text{sen } 120°}$

$T = \frac{50\sqrt{3}}{3}\ N$

$\frac{\mathbb{C}}{\text{sen } 150°} = \frac{25}{\text{sen } 120°}$

$\mathbb{C} = \frac{25\sqrt{3}}{3}\ N$

06. d

$$\frac{T_1}{\text{sen } 90°} = \frac{200}{\text{sen } 135°}$$

$T_1 \cong 283$ N

$$\frac{T_2}{\text{sen } 135°} = \frac{200}{\text{sen } 135°}$$

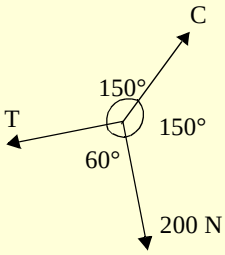
$T_2 \cong 200$ N

07. $\frac{T}{\text{sen } 150°} = \frac{200}{\text{sen } 150°}$

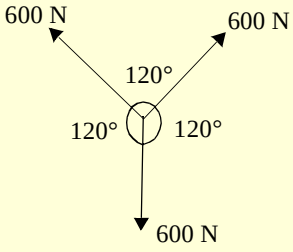
$T = 200$ N

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

$C = 200\sqrt{3}$ N

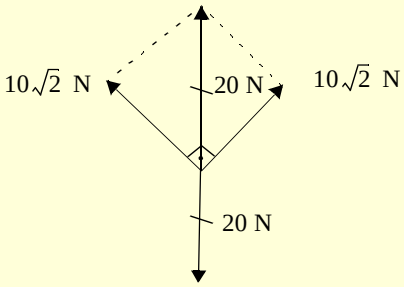


08. d



09. d

10. c



Testes complementares

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

01. $P = m \cdot g$
$P = 0{,}2 \cdot 10$
$P = 2$ N

02. Peso e normal

03. Como os hemisférios continuam em equilíbrio, e o número de cavalos que puxa um hemisfério não muda, a tração permanece igual.

04. Atrito e peso

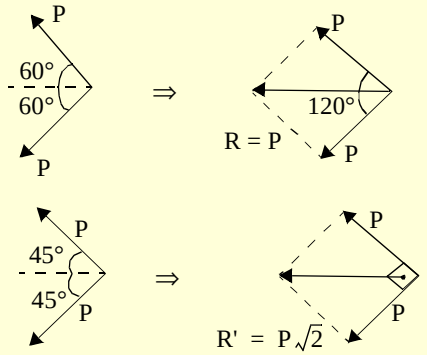
05. Somente o peso, uma vez que na Lua não há atmosfera, e portanto não há atrito.

06. $R^2 = F^2 + P^2 + 2 \cdot F \cdot P \cdot \cos 60°$

$R^2 = 30^2 + 50^2 + 2 \cdot 30 \cdot 50 \cdot \frac{1}{2}$

$R^2 = 4\,900$
$R = 70$ N
$\therefore R = m \cdot a$
$70 = 5 \cdot a$
$a = 14$ m/s^2

07.



$\frac{R'}{R} = \frac{P\sqrt{2}}{P}$

$\frac{R'}{R} = \sqrt{2}$

08. Se: $\text{sen } \alpha = \cos \beta$ e $\cos \alpha = \text{sen } \beta$
Então:

$T_1 \cdot \cos \alpha = T_2 \cdot \cos \beta$

$\cos \alpha = \frac{T_2 \cdot \cos \beta}{T_1}$

$T_1 \cdot \cos \beta + T_2 \cdot \cos \alpha = P$

$T_1 \cdot \cos \beta + T_2 \cdot \frac{T_2 \cdot \cos \beta}{T_1} = P$

$\therefore \cos \beta = \frac{T_1 \cdot P}{T_1^2 + T_2^2}$

09. $F = k \cdot x$
$F = 20 \cdot 0{,}2$
$F = 4$ N
Logo: $5 - 4 = 1$ N

10. Considerando: 1 kgf = 10 N
Temos: 1 600 kgf = 16 000 N
5 pessoas de 80 kg = 400 kg, ou 4 000 N
Carga total: 20 000 N
Supondo que a carga total se distribua igualmente nas quatro molas, cada mola suportará uma força de 5 000 N.
Assim:

$F = k \cdot x$

$5\,000 = k \cdot 0{,}05$

$k = 100\,000$ N/m