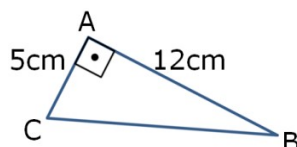


Gabarito da Lista 02

Razões Trigonométricas
no Triângulo Retângulo

01.

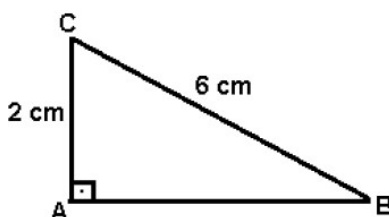


a) $(BC)^2 = 5^2 + 12^2 \Rightarrow (BC)^2 = 169 \Rightarrow BC = 13 \text{ cm}$

b) Cateto Oposto: AC e Cateto Adjacente: AB

c) $\cos \hat{B} = \frac{12}{13}$; $\sin \hat{C} = \frac{12}{13}$ e $\text{tg} \hat{B} = \frac{5}{12}$

02.



a) $6^2 = 2^2 + (AB)^2 \Rightarrow 36 = 4 + (AB)^2 \Rightarrow 34 = (AB)^2 \Rightarrow AB = \sqrt{34}$

b) $\sin \hat{B} = \frac{2}{6} = \frac{1}{3}$; $\text{tg} \hat{C} = \frac{\sqrt{34}}{2}$

c) $\cos^2 \hat{C} + \sin^2 \hat{C} = \left(\frac{2}{6}\right)^2 + \left(\frac{\sqrt{34}}{6}\right)^2 = \frac{4}{36} + \frac{34}{36} = \frac{36}{36} = 1$

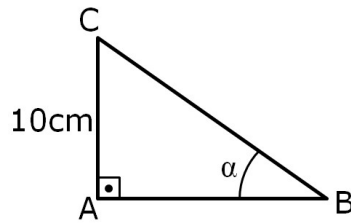
d) $2\sin \hat{B} + \sqrt{2} \cos \hat{B} = 2 \cdot \frac{2}{6} + \sqrt{2} \cdot \frac{\sqrt{34}}{6} = \frac{4}{6} + \frac{\sqrt{68}}{6} = \frac{4 + 2\sqrt{17}}{6}$

03.

$$\sin^2 \hat{B} + \cos^2 \hat{B} = 1 \Rightarrow \left(\frac{2}{5}\right)^2 + \cos^2 \hat{B} = 1 \Rightarrow \cos^2 \hat{B} = 1 - \frac{4}{25} = \frac{25-4}{25} \Rightarrow \cos^2 \hat{B} = \frac{21}{25} \Rightarrow \cos \hat{B} = \frac{\sqrt{21}}{5}$$

$$\text{tg} \hat{B} = \frac{\sin \hat{B}}{\cos \hat{B}} \Rightarrow \text{tg} \hat{B} = \frac{\frac{2}{5}}{\frac{\sqrt{21}}{5}} = \frac{2}{5} \cdot \frac{5}{\sqrt{21}} \Rightarrow \text{tg} \hat{B} = \frac{2}{\sqrt{21}} \Rightarrow \text{tg} \hat{B} = \frac{2}{\sqrt{21}} \cdot \frac{\sqrt{21}}{\sqrt{21}} \Rightarrow \text{tg} \hat{B} = \frac{2\sqrt{21}}{21}$$

04.

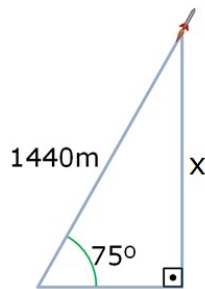


$$\text{sen } \alpha = \frac{5}{13} \Rightarrow \frac{10}{BC} = \frac{5}{13} \Rightarrow 5 \cdot BC = 130 \Rightarrow \text{BC} = 26$$

$$26^2 = 10^2 + (AB)^2 \Rightarrow 676 = 100 + (AB)^2 \Rightarrow 576 = (AB)^2 \Rightarrow \text{AB} = 24$$

Perímetro: $10 + 26 + 24 = 60 \text{ cm}$

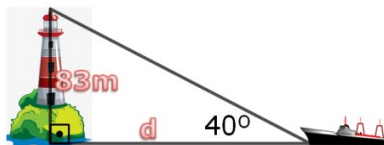
05.



Em 6 segundo o foguete percorre $6 \times 240\text{m} = 1440\text{m}$

$$\text{sen } 75^\circ = \frac{x}{1440} = 0,97 \Rightarrow x = 1440 \times 0,97 \Rightarrow x = 1396,8 \text{ m}$$

06.



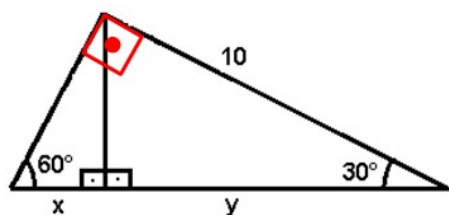
$$\text{tg } 40^\circ = \frac{83}{d} = 0,83 \Rightarrow 0,83d = 83 \Rightarrow d = 100 \text{ m}$$

07.

$$\text{a) } \text{tg } 30^\circ = \frac{8}{x} = \frac{\sqrt{3}}{3} \Rightarrow x\sqrt{3} = 24 \Rightarrow x = \frac{24}{\sqrt{3}} \Rightarrow x = 8\sqrt{3}$$

$$\text{b) } \text{sen } 60^\circ = \frac{6\sqrt{3}}{x} = \frac{\sqrt{3}}{2} \Rightarrow x = 12$$

c)



$$\cos 30^\circ = \frac{y}{10} = \frac{\sqrt{3}}{2} \Rightarrow y = 5\sqrt{3}$$

$$\cos 30^\circ = \frac{10}{x+y} = \frac{\sqrt{3}}{2} \Rightarrow x\sqrt{3} + 10\sqrt{3} = 20 \Rightarrow x = \frac{20 - 10\sqrt{3}}{\sqrt{3}} \Rightarrow x = \frac{20\sqrt{3} - 30}{3}$$

$$d) \cos 45^\circ = \frac{x}{10} = \frac{\sqrt{2}}{2} \Rightarrow x = 5\sqrt{2}$$

$$e) \operatorname{tg} 60^\circ = \frac{x}{4} = \sqrt{3} \Rightarrow x = 4\sqrt{3}$$

$$\operatorname{tg} 45^\circ = \frac{y}{x} = 1 \Rightarrow y = 4\sqrt{3}$$

$$f) \cos 60^\circ = \frac{3\sqrt{2}}{x} = \frac{1}{2} \Rightarrow x = 6\sqrt{2}$$

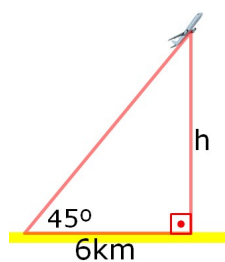
$$\cos 30^\circ = \frac{y}{x} = \frac{\sqrt{3}}{2} \Rightarrow y = 3\sqrt{6}$$



08.

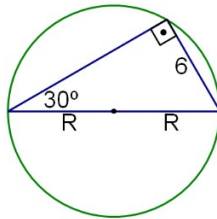
$$\frac{1 \cdot \left(\frac{1}{2} + \frac{1}{2} \right)}{\frac{\sqrt{3}}{3}} = \frac{1}{\frac{\sqrt{3}}{3}} = \frac{3}{\sqrt{3}} = \frac{\sqrt{3}}{\sqrt{3}} = \sqrt{3}$$

09.



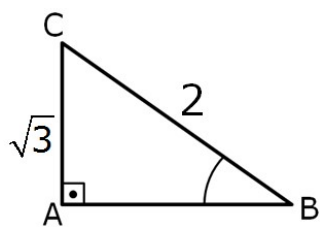
$$\operatorname{tg} 45^\circ = \frac{h}{6} = 1 \Rightarrow h = 6\text{km}$$

10.

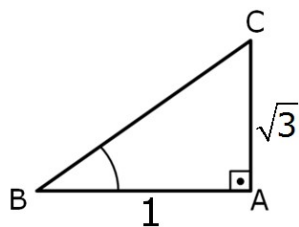


$$\operatorname{tg} 30^{\circ} = \frac{6}{2R} = \frac{\sqrt{3}}{3} \Rightarrow \frac{3}{R} = \frac{\sqrt{3}}{3} \Rightarrow R\sqrt{3} = 9 \Rightarrow R = \frac{9}{\sqrt{3}} \Rightarrow R = \frac{9}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} \Rightarrow R = \frac{9\sqrt{3}}{3} \Rightarrow R = 3\sqrt{3} \text{ cm}$$

11.

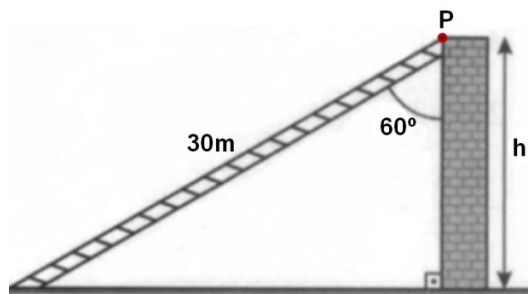


$$\operatorname{sen} B = \frac{\sqrt{3}}{2} \Rightarrow B = 60^{\circ}$$



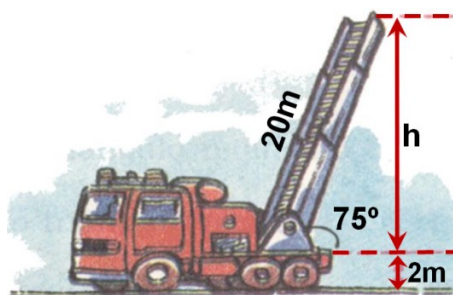
$$\operatorname{tg} B = \frac{\sqrt{3}}{1} \Rightarrow B = 60^{\circ}$$

12.



$$\cos 60^{\circ} = \frac{1}{2} = \frac{h}{30} \Rightarrow h = 15 \text{ m}$$

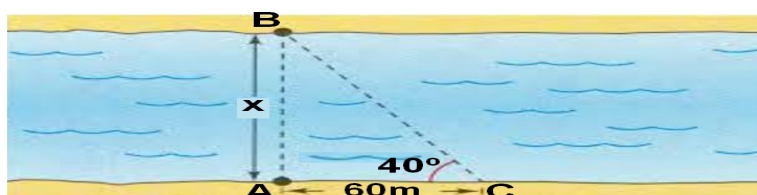
13.



$$\sin 75^\circ = \frac{h}{20} = 0,97 \Rightarrow h = 19,4 \text{ m}$$

Somando a distância do chão, teremos: $19,4 + 2 = 21,4 \text{ m}$.

14.



$$\tan 40^\circ = \frac{x}{60} = 0,83 \Rightarrow x = 49,8 \text{ m}$$