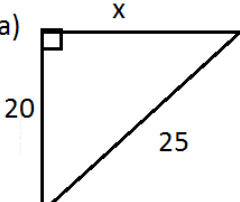
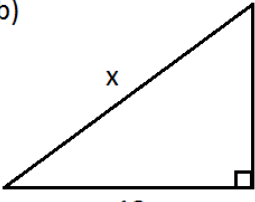
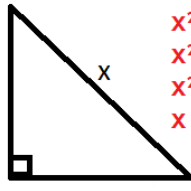
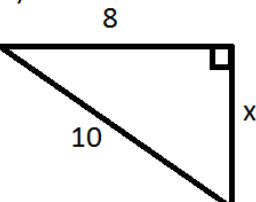


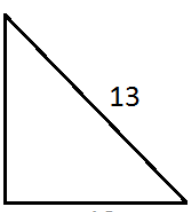
1- Calcule o valor de x nos triângulos abaixo:

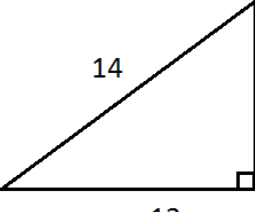
a)   $25^2 = 20^2 + x^2$   
 $625 = 400 + x^2$   
 $625 - 400 = x^2$   
 $225 = x^2$   
 $x = \sqrt{225}$   
 $x = 15$

b)   $x^2 = 9^2 + 12^2$   
 $x^2 = 81 + 144$   
 $x^2 = 225$   
 $x = \sqrt{225}$   
 $x = 15$

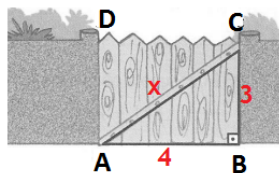
c)   $x^2 = 3^2 + 4^2$   
 $x^2 = 9 + 16$   
 $x^2 = 25$   
 $x = \sqrt{25}$   
 $x = 5$

d)   $10^2 = 8^2 + x^2$   
 $100 = 64 + x^2$   
 $100 - 64 = x^2$   
 $36 = x^2$   
 $x = \sqrt{36}$   
 $x = 6$

e)   $13^2 = x^2 + 12^2$   
 $169 = x^2 + 144$   
 $169 - 144 = x^2$   
 $25 = x^2$   
 $x = \sqrt{25}$   
 $x = 5$

f)   $14^2 = 13^2 + x^2$   
 $196 = 169 + x^2$   
 $196 - 169 = x^2$   
 $x^2 = 27$   
 $x = \sqrt{27}$   
 $x = 3\sqrt{3}$

2- Abaixo, o portão de entrada de uma casa tem 4m de comprimento e 3m de altura. Que comprimento teria uma trave de madeira que se estendesse do ponto A até o C?



$$x^2 = 4^2 + 3^2$$

$$x^2 = 16 + 9$$

$$x^2 = 25$$

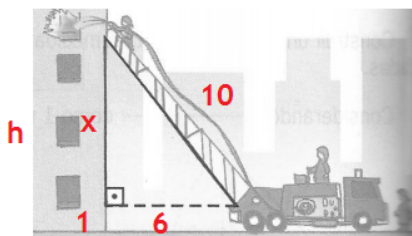
$$x = \sqrt{25}$$

$$x = 5$$

$$\begin{array}{r} 27 \\ 9 \overline{) 27} \\ \underline{9} \phantom{0} \\ 3 \phantom{0} \\ 3 \phantom{0} \\ \underline{1} \phantom{0} \\ 1 \phantom{0} \end{array}$$

$27 = 3^3 = 3^2 \cdot 3$   
 $\sqrt{3^2 \cdot 3} = \sqrt{3^2} \cdot \sqrt{3}$

3- Durante um incêndio num edifício de apartamentos, os bombeiros utilizaram uma escada de 10m para atingir a janela do apartamento em fogo. A escada estava colocada a 1m do chão e afastada 6m do edifício. Qual é a altura do edifício em chamas em relação ao chão?



$$h = x + 1 \quad \Rightarrow \quad h = 8 + 1$$

$$h = 9 \text{ m}$$

$$10^2 = x^2 + 6^2$$

$$100 = x^2 + 36$$

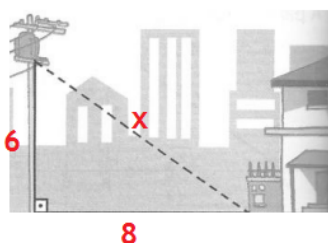
$$100 - 36 = x^2$$

$$64 = x^2$$

$$x = \sqrt{64}$$

$$x = 8$$

4- Quantos metros de fio são necessários para "puxar luz" de um poste de 6m de altura até a caixa de luz que está ao lado da casa e a 8m da base do poste?



$$x^2 = 6^2 + 8^2$$

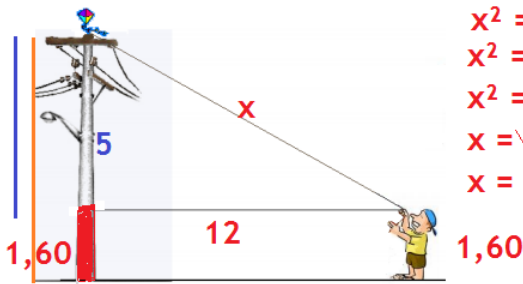
$$x^2 = 36 + 64$$

$$x^2 = 100$$

$$x = \sqrt{100}$$

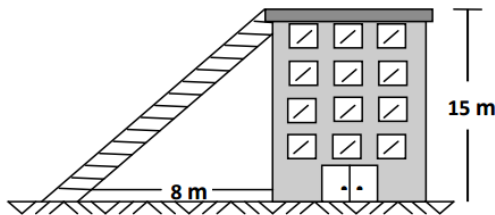
$$x = 10$$

5- A distância do menino ao poste é de 12 metros, sabendo que o menino tem 1,60m e a altura do poste é de 6,60m, a que distância está a pipa do menino?



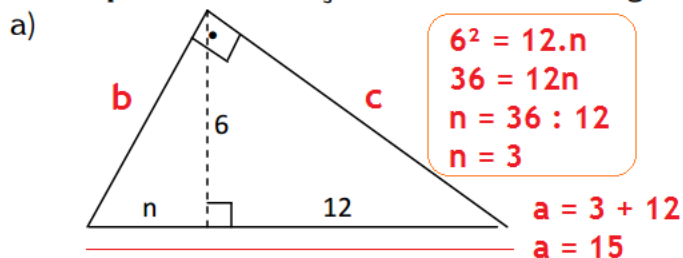
$$\begin{aligned}x^2 &= 12^2 + 5^2 \\x^2 &= 144 + 25 \\x^2 &= 169 \\x &= \sqrt{169} \\x &= 13\end{aligned}$$

6- A figura mostra um edifício que tem 15 m de altura, com uma escada colocada a 8 m de sua base ligada ao topo do edifício. O comprimento dessa escada é de:



$$\begin{aligned}x^2 &= 8^2 + 15^2 \\x^2 &= 64 + 225 \\x^2 &= 289 \\x &= \sqrt{289} \\x &= 17\end{aligned}$$

7- Aplicando as relações métricas nos triângulos retângulos abaixo, determine o valor **solicitado**:

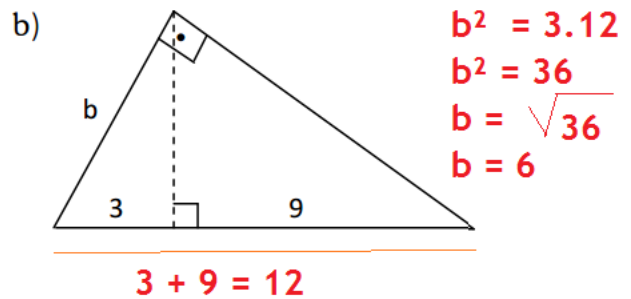


$$\begin{aligned}6^2 &= 12 \cdot n \\36 &= 12n \\n &= 36 : 12 \\n &= 3\end{aligned}$$

$$\begin{aligned}a &= 3 + 12 \\a &= 15\end{aligned}$$

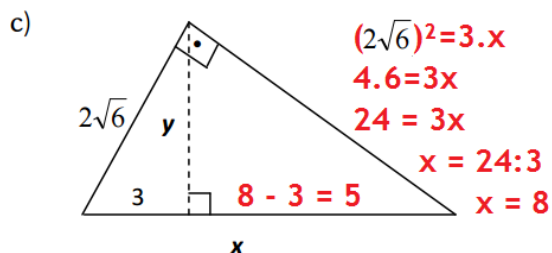
$$\begin{aligned}b^2 &= 15 \cdot 3 \\b^2 &= 45 \\b &= \sqrt{45} \\b &= 3\sqrt{5}\end{aligned}$$

$$\begin{aligned}c^2 &= 15 \cdot 12 \\c^2 &= 180 \\c &= \sqrt{180} \\c &= 2.3\sqrt{5} \\c &= 6\sqrt{5}\end{aligned}$$



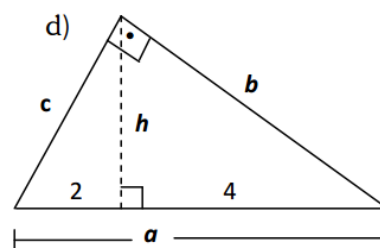
$$\begin{aligned}b^2 &= 3 \cdot 12 \\b^2 &= 36 \\b &= \sqrt{36} \\b &= 6\end{aligned}$$

$$3 + 9 = 12$$



$$\begin{aligned}(2\sqrt{6})^2 &= 3 \cdot x \\4 \cdot 6 &= 3x \\24 &= 3x \\x &= 24 : 3 \\x &= 8\end{aligned}$$

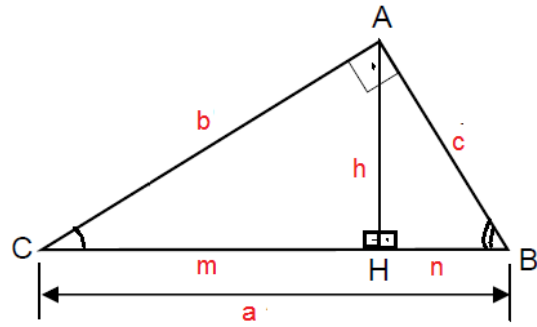
$$\begin{aligned}y^2 &= 3 \cdot 5 \\y^2 &= 15 \\y &= \sqrt{15}\end{aligned}$$



$$\begin{aligned}h^2 &= 2 \cdot 4 & c^2 &= 2 \cdot 6 & b^2 &= 4 \cdot 6 \\h^2 &= 8 & c^2 &= 12 & b &= \sqrt{4 \cdot 6} \\h &= \sqrt{8} & c &= \sqrt{12} & b &= 2 \cdot \sqrt{6} \\h &= 2 \cdot \sqrt{2} & c &= \sqrt{4 \cdot 3} & & \\ & & c &= 2 \cdot \sqrt{3} & & \end{aligned}$$

$$b^2 = a \cdot m \quad h^2 = m \cdot n$$

$$c^2 = a \cdot n \quad ah = bc$$



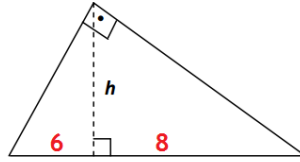
8- Em um triângulo retângulo as projeções dos catetos sobre a hipotenusa medem 6 cm e 8 cm. Determine a altura relativa à hipotenusa desse triângulo.

$$h^2 = 6 \cdot 8$$

$$h^2 = 48$$

$$h = \sqrt{48}$$

$$h = 4\sqrt{3}$$

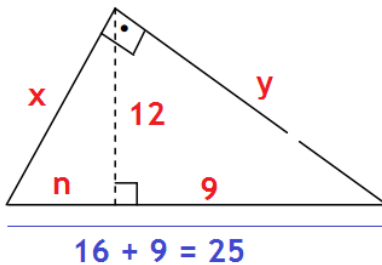


$$\begin{array}{r} 48 \ 2 \\ 24 \ 2 \\ 12 \ 2 \\ 6 \ 2 \\ 3 \ 3 \\ 1 \end{array} \begin{array}{l} \cdot 2 \\ \cdot 2 \\ \cdot 2 \\ \cdot 2 \\ \cdot 3 \\ \cdot 3 \end{array}$$


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$$4\sqrt{3}$$

9- A medida da altura relativa à hipotenusa de um triângulo retângulo é 12 cm e uma das projeções mede 9 cm. Calcular a medida dos catetos desse triângulo.



$$12^2 = 9 \cdot n$$

$$144 = 9n$$

$$n = 144 : 9$$

$$n = 16$$

$$x^2 = 16 \cdot 25$$

$$x^2 = 400$$

$$x = \sqrt{400}$$

$$x = 20$$

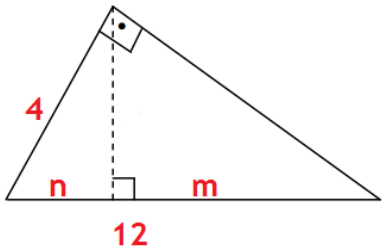
$$y^2 = 9 \cdot 25$$

$$y^2 = 225$$

$$y = \sqrt{225}$$

$$y = 15$$

10- Determine a medida das projeções em um triângulo retângulo cuja hipotenusa mede 12 cm e um dos catetos 4 cm.



$$4^2 = 12 \cdot n$$

$$16 = 12n$$

$$n = \frac{16}{12}$$

$$n = \frac{4}{3}$$

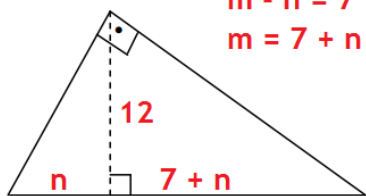
$$n + m = 12$$

$$m = 12 - \frac{4}{3}$$

$$m = \frac{36 - 4}{3}$$

$$m = \frac{32}{3}$$

11- Em um triângulo retângulo a altura relativa à hipotenusa mede 12 cm e a diferença entre as medidas das projeções dos catetos sobre a hipotenusa é 7 cm. A hipotenusa desse triângulo mede:



$$m - n = 7$$

$$m = 7 + n$$

$$12^2 = (7 + n) \cdot n$$

$$144 = 7n + n^2$$

$$n^2 + 7n - 144 = 0$$

$$a = 1, b = 7, c = -144$$

$$n = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$m = 7 + n$$

$$m = 7 + 9$$

$$m = 16$$

$$n = \frac{-7 \pm \sqrt{7^2 - 4 \cdot 1 \cdot (-144)}}{2 \cdot 1}$$

$$n = \frac{-7 \pm \sqrt{49 + 576}}{2}$$

$$n = \frac{-7 \pm \sqrt{625}}{2}$$

$$n = \frac{-7 \pm 25}{2} = \frac{-7 + 25}{2}$$

$$n = \frac{18}{2} = 9$$

$$\text{hipotenusa} = m + n$$

$$m + n = 16 + 9$$

$$m + n = 25$$