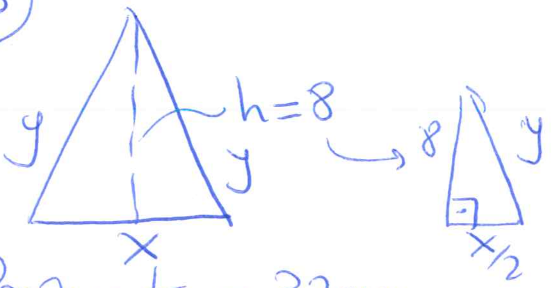
PROB. GEOMETRIA

05



Perímetro = 32cm

$$\left.\begin{aligned} x+2y&=32 \\ 8^2+\left(\frac{x}{2}\right)^2&=y^2 \end{aligned}\right\} \rightarrow x=32-2y$$

$$64+\left(\frac{32-2y}{2}\right)^2=y^2$$

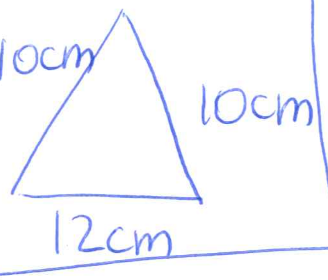
$$64+(16-y)^2=y^2$$

$$64+256+\cancel{y^2}-32y=\cancel{y^2}$$

$$32y=320$$

$$\boxed{y=10} \rightarrow \boxed{x=12}$$

Sol:



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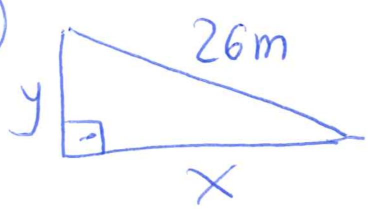


$$\left.\begin{aligned} x+y&=34 \\ x^2+y^2&=26^2 \end{aligned}\right\} \rightarrow y=34-x$$

$$x^2+(34-x)^2=676$$

$$x^2+1156-68x+x^2=676$$

$$2x^2-68x+480=0$$

$:2$

$$x^2-34x+240=0$$

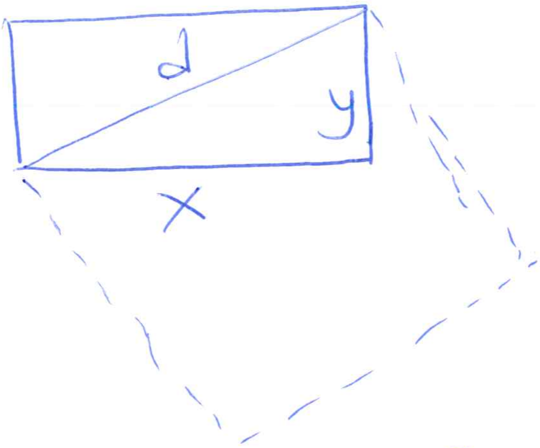
$$x=\frac{34\pm\sqrt{1156-960}}{2}=\frac{34\pm14}{2} \begin{cases} 24 \\ 10 \end{cases}$$

$x_1=24 \rightarrow y_1=10$

$x_2=10 \rightarrow y_2=24$

Sol: Un cateto mide 10m y el otro 24m

64



$d^2 = x^2 + y^2$

Por Pitágoras

$A_{cuadrado} = 205\ cm^2$

$A_{rectángulo} = 78\ cm^2$

$$\left.\begin{array}{l} xy = 78 \\ x^2 + y^2 = 205 \end{array}\right\} \rightarrow y = \frac{78}{x}$$

$$x^2 + \left(\frac{78}{x}\right)^2 = 205$$

$$x^2 + \frac{6084}{x^2} = 205$$

$$x^4 + 6084 = 205x^2$$

$$x^4 - 205x^2 + 6084 = 0$$

Cambio vble $x^2 = t \rightarrow t^2 - 205t + 6084 = 0$

$$t = \frac{205 \pm \sqrt{42025 - 24336}}{2} =$$

$$= \frac{205 \pm 133}{2} \begin{cases} \boxed{169} \\ \boxed{36} \end{cases}$$

Deshago el cambio de variable:

$x = \cancel{\pm}\sqrt{t} \longrightarrow x_1 = \sqrt{169} = 13$

No pr el problema

$x_2 = \sqrt{36} = 6$

- $x_1 = 13 \rightarrow y_1 = \frac{78}{13} = 6$
- $x_2 = 6 \rightarrow y_2 = \frac{78}{6} = 13$

Son la misma solución.

$\boxed{\text{Sol: El rectángulo mide } 6\,cm \times 13\,cm}$

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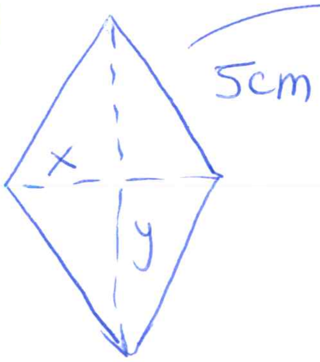

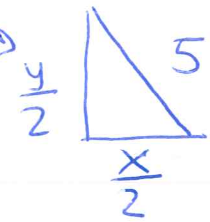

Área $= 24\ cm^2 \left(\frac{D \cdot d}{2}\right)$

$$\left.\begin{aligned} \left(\frac{x}{2}\right)^2+\left(\frac{y}{2}\right)^2 &= 5^2 \\ \frac{xy}{2} &= 24 \end{aligned}\right\}$$

$$\left.\begin{aligned} \frac{x^2}{4}+\frac{y^2}{4} &= 25 \\ xy &= 48 \end{aligned}\right\} \quad \left.\begin{aligned} x^2+y^2 &= 100 \\ xy &= 48 \end{aligned}\right\} \rightarrow y=\frac{48}{x}$$

$$\rightarrow \quad x^2+\left(\frac{48}{x}\right)^2 = 100$$

$$x^2+\frac{2304}{x^2} = 100$$

$$x^4+2304 = 100x^2$$

$$x^4-100x^2+2304 = 0 \qquad \text{c. vble } x^2=t$$

$$t^2-100t+2304=0$$

$$t=\frac{100\pm\sqrt{10000-9216}}{2}=\frac{100\pm 28}{2} \begin{cases} 64 \rightarrow x=\cancel{\pm}8 \\ 36 \rightarrow x=\cancel{\pm}6 \end{cases}$$

- $x=8 \rightarrow y=\frac{48}{8}=6$ ⎫ Misma solución.
- $x=6 \rightarrow y=\frac{48}{6}=8$ ⎭

$\boxed{\text{Sol: Las diagonales del rombo medirán 8cm y 6cm}}$

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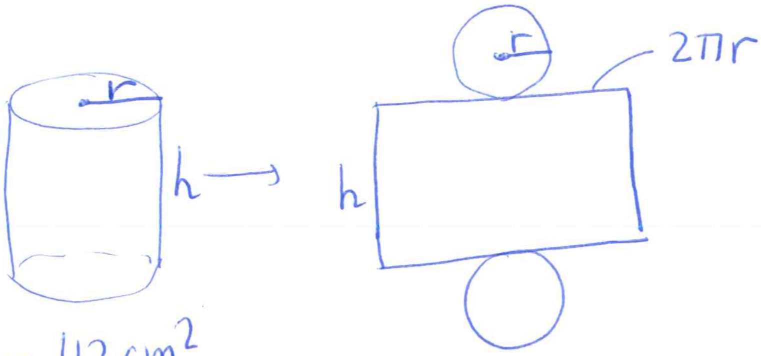

$A_c = 112\,cm^2$

$$A_{cilindro} = 2 \cdot A_{circulo} + A_{rect.} = 2 \cdot \pi r^2 + h \cdot 2\pi r$$

$V?$ $\quad (V = \pi r^2 \cdot h)$

$$\left.\begin{array}{l} 2\pi r^2 + 2\pi h r = 112 \\ r + h = 14 \end{array}\right\} \rightarrow h = 14 - r$$

$$\rightarrow 2\pi r^2 + 2\pi(14-r)\cdot r = 112$$

$$\cancel{2\pi r^2} + 28\pi r - \cancel{2\pi r^2} = 112$$

$$\boxed{r = \frac{112}{28\pi} = \frac{4}{\pi}} \rightarrow \boxed{h = 14 - \frac{4}{\pi} = \frac{14\pi - 4}{\pi}}$$

$$\boxed{V = \pi r^2 \cdot h = \cancel{\pi} \cdot \left(\frac{4}{\pi}\right)^2 \cdot \frac{14\pi - 4}{\cancel{\pi}} = \frac{16}{\pi^2} \cdot (14\pi - 4) \simeq 64,82\ cm^3}$$

Sol: el volumen del cilindro serán $64,82\,cm^2$

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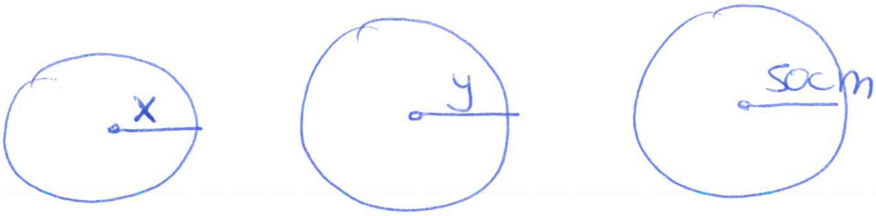

$$\left.\begin{array}{l} x+y=70 \\ \cancel{\pi}x^2+\cancel{\pi}y^2=\cancel{\pi}\cdot 50^2 \end{array}\right\} \quad \left.\begin{array}{l} x+y=70 \\ x^2+y^2=2500 \end{array}\right\}$$

$\rightarrow y=70-x$

$\rightarrow x^2+(70-x)^2=2500$

$x^2+4900+x^2-140x=2500$

$2x^2-140x+2400=0$

$:2$

$x^2-70x+1200=0$

$$x=\frac{70\pm\sqrt{4900-4800}}{2}=\frac{70\pm 10}{2} \begin{cases} 40 \\ 30 \end{cases}$$

- $x=40 \rightarrow y=30$
- $x=30 \rightarrow y=40$

$\Rightarrow$ $\boxed{\text{Sol: Un círculo es de radio 30cm y el otro de radio 40cm}}$