DOBLE TANGENTE

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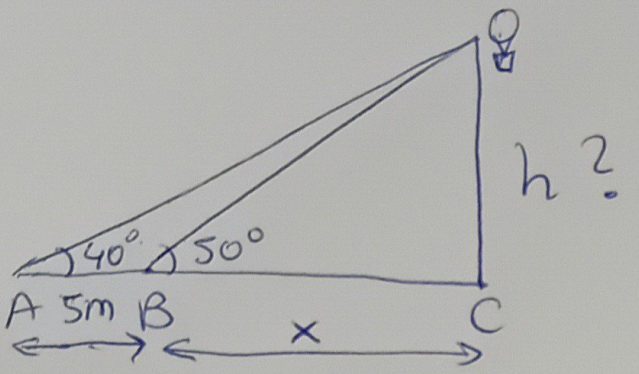

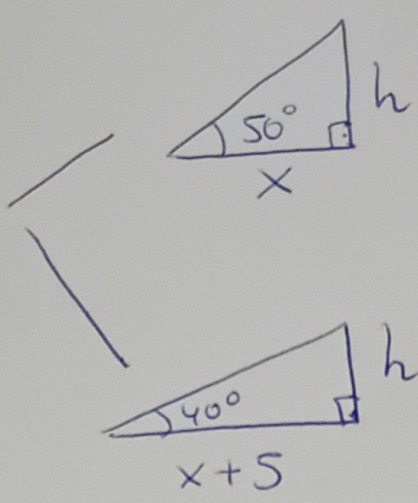

$$tg\,50 = \frac{h}{x} \qquad tg\,40 = \frac{h}{x+5}$$

$$\rightarrow h = x \cdot tg\,50$$

$$\rightarrow h = (x+5)\,tg\,40$$

$$\rightarrow \quad x \cdot tg\,50 = (x+5)\,tg\,40$$

$$x\,tg\,50 = x \cdot tg\,40 + 5 \cdot tg\,40$$

$$x\,tg\,50 - x\,tg\,40 = 5 \cdot tg\,40$$

$$x\,(tg\,50 - tg\,40) = 5 \cdot tg\,40$$

$$\boxed{x = \frac{5 \cdot tg\,40}{tg\,50 - tg\,40} = 11{,}9\,m}$$

$$\downarrow$$

$$\boxed{h = x \cdot tg\,50 = 11{,}9 \cdot tg\,50 = 14{,}18\,m}$$

Sol: El globo está a 14,18 m de altura

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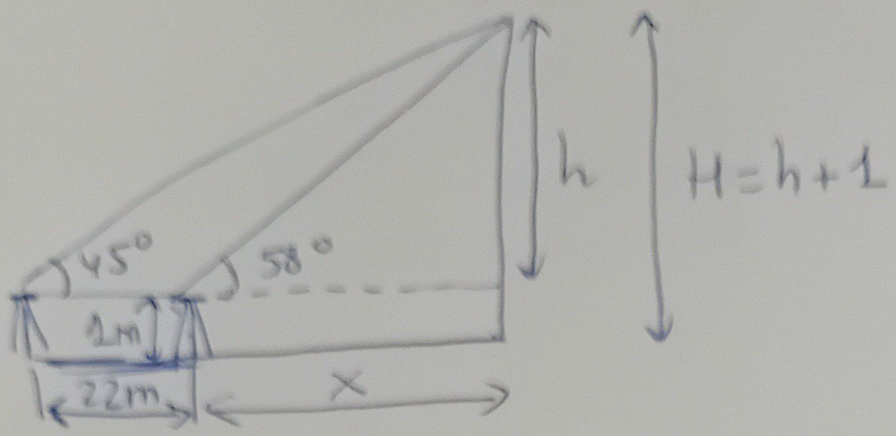
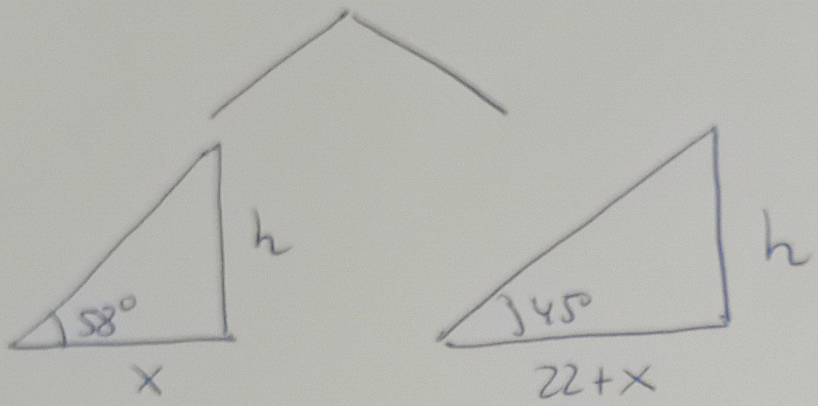


Un teodolito es un aparato para medir ángulos, y la medida nos la da a una altura de 1m, por las patas sobre las que se apoya.



$\operatorname{tg} 58° = \frac{h}{x}$ $\qquad$ $\operatorname{tg} 45° = 1 = \frac{h}{22+x}$

($\operatorname{tg} 45° = 1$)

$$\left.\begin{array}{l} \operatorname{tg} 58 = \frac{h}{x} \\ 1 = \frac{h}{22+x} \end{array}\right\} \begin{array}{l} \longrightarrow h = x \cdot \operatorname{tg} 58 \\ \longrightarrow h = 22 + x \end{array} \Big\} \longrightarrow x \cdot \operatorname{tg} 58 = 22 + x$$

$$x \cdot \operatorname{tg} 58 - x = 22$$

$$x(\operatorname{tg} 58 - 1) = 22$$

$$\boxed{x = \frac{22}{\operatorname{tg} 58 - 1} = 36{,}65\,m}$$

$$\boxed{h = 22 + x = 22 + 36{,}65 = 58{,}65\,m}$$

$$\Longrightarrow \boxed{H = h + 1 = 58{,}65 + 1 = 59{,}65\,m}$$

(H = altura del monumento + altura del teodolito)

Sol: El monumento mide 59,65 m de altura

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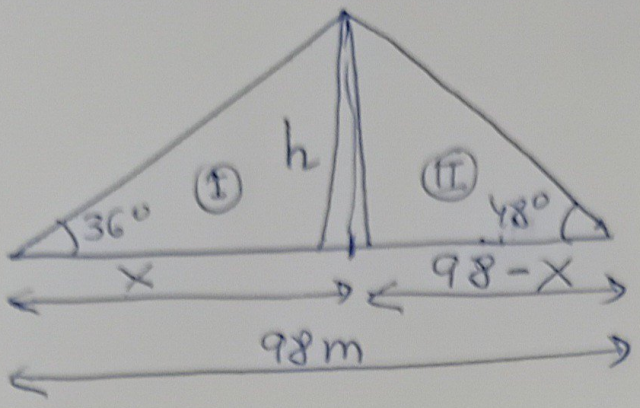

De (I): $tg\,36° = \frac{h}{x}$

De (II): $tg\,48° = \frac{h}{98-x}$

$\rightarrow h = x \cdot tg\,36$

$\rightarrow h = (98-x)\,tg\,48$

$x \cdot tg\,36 = (98-x)\,tg\,48$

$x \cdot tg\,36 = 98 \cdot tg\,48 - x \cdot tg\,48$

$x\,tg\,36 + x\,tg\,48 = 98 \cdot tg\,48$

$x\,(tg\,36 + tg\,48) = 98 \cdot tg\,48$

$$x = \frac{98 \cdot tg\,48}{tg\,36 + tg\,48} = 59{,}24\,m$$

$h = x \cdot tg\,36 = 59{,}24 \cdot tg\,36 = 43{,}04\,m$

Sol: La antena mide 43,04m de alto

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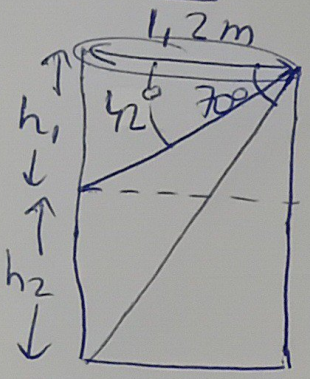
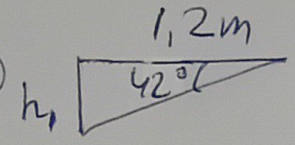
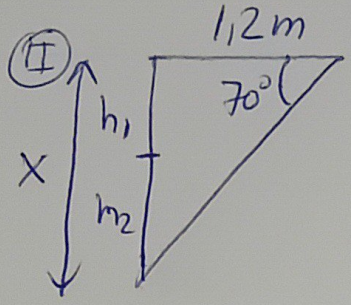


(I) 

$\rightarrow \quad tg\,42 = \frac{h_1}{1,2}$

$\boxed{h_1 = 1,2 \cdot tg\,42 = 1,08\,m}$

(II) 

$tg\,70° = \frac{x}{1,2}$

$\boxed{x = 1,2 \cdot tg\,70 = 3,3\,m}$

$\boxed{h_2 = x - h_1 = 3,3 - 1,08 = 2,22m}$

Sol: La altura del pozo es de 3,3m. El agua subió 2,22m

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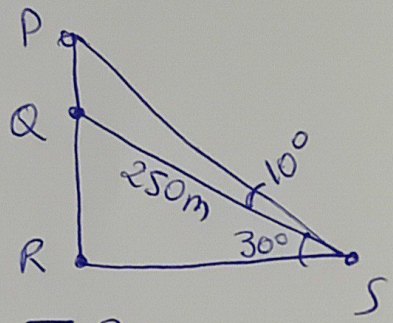
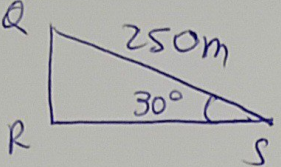


$\overline{PQ}$?

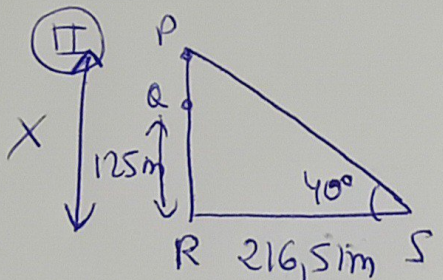
(I) 

- $sen\,30° = \frac{\overline{RQ}}{250}$

$\boxed{\overline{RQ} = 250 \cdot sen\,30 = 125m}$

- $\cos 30° = \frac{\overline{RS}}{250}$

$\boxed{\overline{RS} = 250 \cdot \cos 30 = 216,51m}$

(II) 

$tg\,40 = \frac{x}{216,5}$

$\boxed{x = 216,51 \cdot tg\,40 = 181,67\,m}$

$x = \overline{PQ} + \overline{QR} \rightarrow \boxed{\overline{PQ} = x - \overline{QR} = 181,67 - 125 = 56,67\,m}$

Sol: El edificio mide 56,67m de alto.

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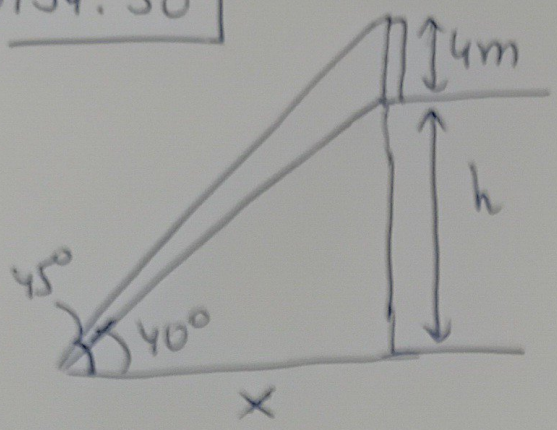
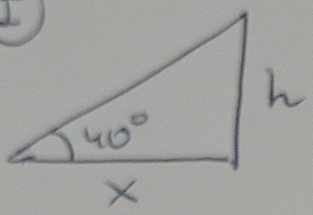
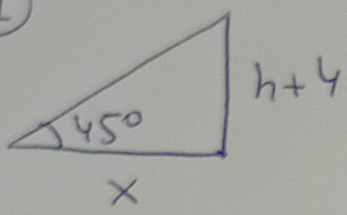


(I)



$$tg\,40° = \frac{h}{x}$$

(II)



$$tg\,45° = 1 = \frac{h+4}{x}$$

$$\Big\} \rightarrow x = h+4$$

↓ en I

$$tg\,40 = \frac{h}{h+4}$$

$$tg\,40(h+4) = h$$

$$h \cdot tg\,40 + 4 \cdot tg\,40 = h$$

$$4\,tg\,40 = h - h\,tg\,40$$

$$4\,tg\,40 = h(1 - tg\,40)$$

$$\boxed{h = \frac{4\,tg\,40}{1 - tg\,40} = 20{,}86\,m}$$

Como x no me lo piden, no hace falta que lo calculemos.

Sol: La altura del edificio es de 20,86 m