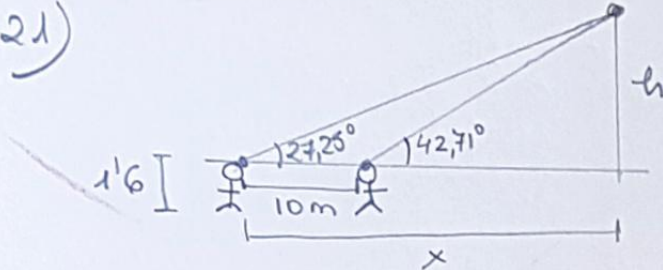


21)



$$\left. \begin{aligned} \operatorname{tg} 27,25^\circ &= \frac{h}{x} \\ \operatorname{tg} 42,71^\circ &= \frac{h}{x-10} \end{aligned} \right\} \text{ (p.13)}$$

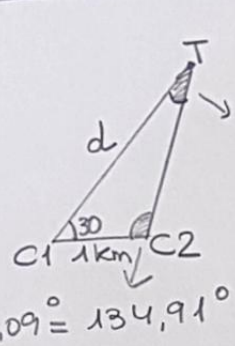
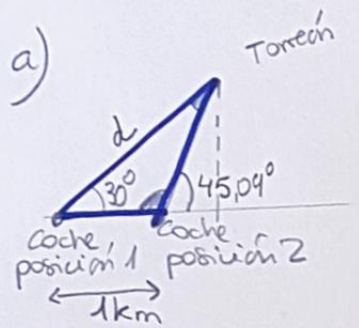
$$x = \frac{h}{\operatorname{tg} 27,25^\circ} ; \operatorname{tg} 42,71^\circ (x-10) = h$$

$$\operatorname{tg} 42,71^\circ \left( \frac{h}{\operatorname{tg} 27,25^\circ} - 10 \right) = h ; \frac{\operatorname{tg} 42,71^\circ}{\operatorname{tg} 27,25^\circ} h - 10 \operatorname{tg} 42,71^\circ = h$$

$$\left( \frac{\operatorname{tg} 42,71^\circ}{\operatorname{tg} 27,25^\circ} - 1 \right) h = 10 \operatorname{tg} 42,71^\circ ; h = \frac{10 \operatorname{tg} 42,71^\circ}{\left( \frac{\operatorname{tg} 42,71^\circ}{\operatorname{tg} 27,25^\circ} - 1 \right)} \approx \boxed{11,65 \text{ m}}$$

$$\Rightarrow H \approx 11,65 + 16 \approx \boxed{13,25 \text{ m}}$$

22) a)



$$45^\circ 5' 24'' \approx 45,09^\circ$$

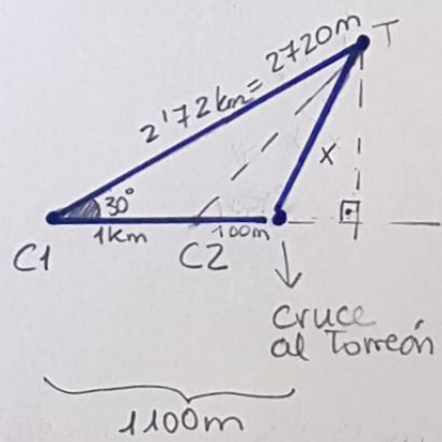
$$180^\circ - (30^\circ + 134,91^\circ) \approx 15,09^\circ$$

$$\frac{d}{\operatorname{sen} 134,91^\circ} = \frac{1 \text{ km}}{\operatorname{sen} 15,09^\circ}$$

$$d = \frac{\operatorname{sen} 134,91^\circ}{\operatorname{sen} 15,09^\circ} = \boxed{2,72 \text{ km}}$$

$$v = 50 \text{ km/h} = \frac{50000 \text{ m}}{60} \frac{\text{m}}{\text{min}}$$

b)



th. coseno

$$x^2 = 2720^2 + 1100^2 - 2 \cdot 2720 \cdot 1100 \cos 30^\circ$$

$$x \approx 1850,97 \text{ m}$$

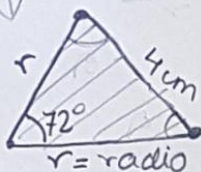
$$\frac{50000 \text{ m}}{1850,97 \text{ m}} \approx \frac{60'}{t}$$

$$\text{tarda: } t = 2,22' \text{ minutos}$$



$$\alpha = \frac{360^\circ}{5} = 72^\circ$$

$$\text{(En general } \alpha = \frac{360^\circ}{n^\circ \text{ lados)}})$$



$$\text{Área triángulo} = \frac{r \cdot r \cdot \text{sen} \frac{360}{5}}{2}$$

$$\text{Área polígono} = 5 \cdot \text{área del triángulo} = 5 \cdot \frac{r^2 \text{sen} 72^\circ}{2}$$

+ Calculamos el radio por el th. coseno.

$$4^2 = r^2 + r^2 - 2r \cdot r \cos 72^\circ$$

$$4^2 = 2r^2 - 2r^2 \cos 72^\circ$$

$$4^2 = 2r^2 (1 - \cos 72^\circ)$$

$$r^2 = \frac{4^2}{2(1 - \cos 72^\circ)} ; \quad r \approx 3.4 \text{ cm}$$

$$\Rightarrow \text{Área polígono} = \frac{5 \cdot 3.4^2 \text{sen} 72^\circ}{2} \approx 27.49 \text{ cm}^2$$

+ En general, el área de un polígono regular

$$A = n^\circ \text{ lados} \cdot \frac{r^2 \text{sen} \left( \frac{360^\circ}{n^\circ \text{ lados}} \right)}{2}$$

$$\text{siendo } r = \text{radio} = \sqrt{\frac{l^2}{2 \left( 1 - \cos \frac{360^\circ}{n^\circ \text{ lados}} \right)}}$$

$l = \text{lado}$

$n = n^\circ \text{ lados}$

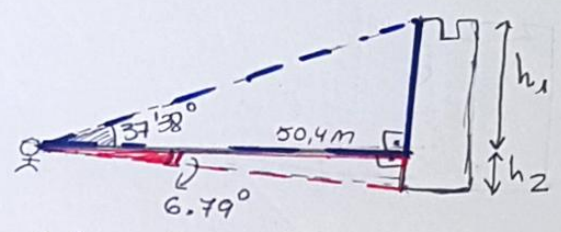
$r = \text{radio}$

$l = \text{lado}$

$$A = \frac{n \cdot r^2 \text{sen} \left( \frac{360}{n} \right)}{2}$$

$$r = \sqrt{\frac{l^2}{2 \left( 1 - \cos \left( \frac{360}{n} \right) \right)}}$$

24



Tenemos 2 triángulos rectángulos

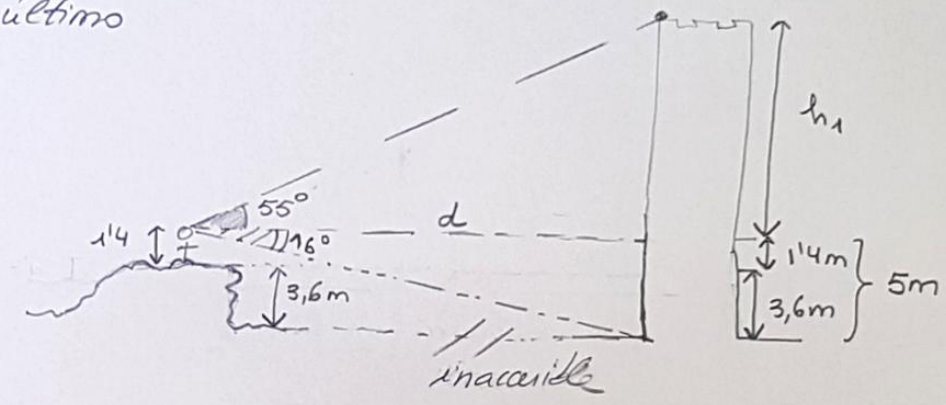
$$\text{tg} 37.38^\circ = \frac{h_1}{50.4}$$

$$\text{tg} 6.79^\circ = \frac{h_2}{50.4}$$

la altura del torreón  $h = h_1 + h_2 = 50.4 \cdot \text{tg} 37.38^\circ + 50.4 \cdot \text{tg} 6.79^\circ$

$$h \approx 44.51\text{m}$$

25 último



$$\text{tg} 55^\circ = \frac{h_1}{d}$$

$$\text{tg} 16^\circ = \frac{5}{d} \Rightarrow d = \frac{5}{\text{tg} 16^\circ} \approx 17.44\text{m} \Rightarrow h_1 = d \text{tg} 55^\circ$$

$$h_1 \approx 24.9\text{m}$$

$$\Rightarrow H = 24.9 + 5 = 29.9\text{m}$$

altura de la torre