

④ Utilizando los ángulos  $30^\circ, 45^\circ, 60^\circ$

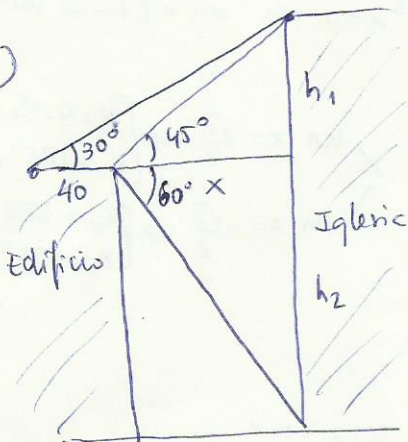
a)  $\sin 105^\circ = \sin (60^\circ + 45^\circ) = \sin 60^\circ \cos 45^\circ + \cos 60^\circ \sin 45^\circ =$   
 $= \frac{\sqrt{3}}{2} \cdot \frac{\sqrt{2}}{2} + \frac{1}{2} \cdot \frac{\sqrt{2}}{2} = \frac{\sqrt{6}}{4} + \frac{\sqrt{2}}{4} = 0,9659$

b)  $\cos 330^\circ = \cos 30^\circ = \frac{\sqrt{3}}{2} = 0,866$

c)  $\operatorname{cosec} 75^\circ = \frac{1}{\sin 75^\circ} = \frac{1}{\sin (45^\circ + 30^\circ)} = \frac{1}{\sin 45^\circ \cdot \cos 30^\circ + \cos 45^\circ \cdot \sin 30^\circ} =$   
 $= \frac{1}{\frac{\sqrt{6}}{4} + \frac{\sqrt{2}}{4}} = 1,035$

d)  $\cotg 22,5^\circ = \cotg \left( \frac{45^\circ}{2} \right) = \frac{1}{\operatorname{tg} \left( \frac{45^\circ}{2} \right)} = \frac{1}{\frac{1 - \cos 45^\circ}{1 + \cos 45^\circ}} = \sqrt{\frac{1 + \sqrt{2}/2}{1 - \sqrt{2}/2}} = \sqrt{\frac{2 + \sqrt{2}}{2 - \sqrt{2}}} = 2,41$

⑤



$$\begin{cases} \operatorname{tg} 30^\circ = \frac{h_1}{40+x} \\ \operatorname{tg} 45^\circ = \frac{h_1}{x} \end{cases} \Rightarrow \begin{cases} h_1 = \operatorname{tg} 30^\circ (40+x) \\ h_1 = x \operatorname{tg} 45^\circ \end{cases} \Rightarrow \begin{cases} x \operatorname{tg} 45^\circ = \operatorname{tg} 30^\circ (40+x) \\ x = 23,09 + 0,58x \\ 0,42x = 23,09 \\ x = \frac{23,09}{0,42} \\ x = 54,98 \text{ m} \end{cases}$$

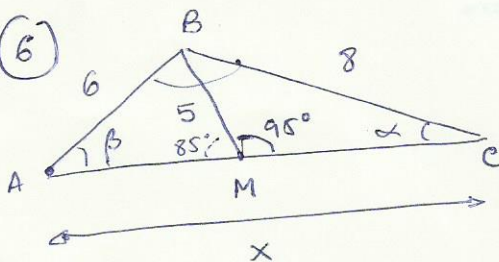
$$h_1 = 54,98 \cdot \operatorname{tg} 45^\circ = 54,98 \text{ m}$$

$$\operatorname{tg} 60^\circ = \frac{h_2}{x} \rightarrow h_2 = 54,98 \cdot \operatorname{tg} 60^\circ$$

$$\boxed{h_2 = 95,23 \text{ m}} \text{ Edificio}$$

$$\boxed{\text{Iglesia: } h_1 + h_2 = 150,21 \text{ m}}$$

⑥



$$\frac{8}{\sin 95^\circ} = \frac{5}{\sin \alpha} \Rightarrow \sin \alpha = \frac{5 \cdot \sin 95^\circ}{8} \Rightarrow$$

$$\boxed{\alpha = 38,51^\circ}$$

$$\frac{6}{\sin 85^\circ} = \frac{5}{\sin \beta} \Rightarrow \sin \beta = \frac{5 \cdot \sin 85^\circ}{6} \Rightarrow$$

$$\boxed{\beta = 56,12^\circ}$$

$$\gamma = 180^\circ - (38,51^\circ + 56,12^\circ) = 85,37^\circ$$

$$x^2 = 8^2 + 6^2 - 2 \cdot 8 \cdot 6 \cdot \cos 85,37^\circ$$

$$x^2 = 92,25$$

$$\boxed{x = 9,61 \text{ km}}$$