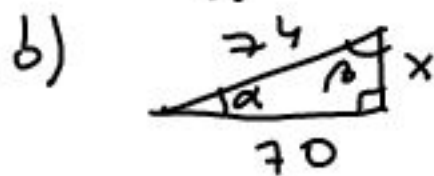
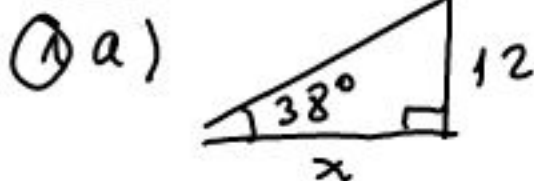


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$$\tan 38^\circ = \frac{12}{x} \Rightarrow x = \frac{12}{\tan 38^\circ} = \underline{15,359 \text{ cm}}$$

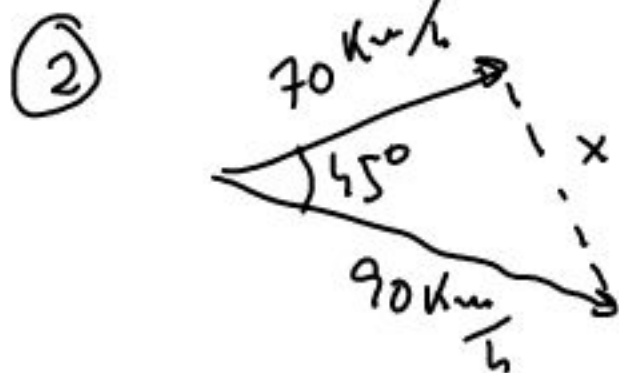


$$x = \sqrt{75^2 - 70^2} = \sqrt{576} = \underline{24 \text{ cm}}$$

$$\alpha = \arcsin\left(\frac{24}{75}\right) = \underline{18^\circ 55' 28.72''}$$

$$\beta = \arcsin\left(\frac{70}{75}\right) = \underline{71^\circ 4' 31.28''}$$

c) $0^\circ < \alpha < 90^\circ$
 $\left. \begin{matrix} \sin \alpha = \frac{2}{7} \\ \Rightarrow \tan \alpha = \frac{\sin \alpha}{\cos \alpha} = \frac{2/7}{\sqrt{1 - (2/7)^2}} = \frac{2/7}{\sqrt{45/49}} = \frac{2/7}{\sqrt{45}/7} = \frac{2}{\sqrt{45}} = \frac{2}{3\sqrt{5}} = \frac{2\sqrt{5}}{15} \approx 0,298142397 \end{matrix} \right\}$



En 1 hora recorren 70 km i 90 km
 Si x = separació en 1 hora, tenim

$$x^2 = 70^2 + 90^2 - 2 \cdot 70 \cdot 90 \cos 45^\circ$$

$$= 13000 - 12600 \frac{\sqrt{2}}{2} = 13000 - 6300\sqrt{2}$$

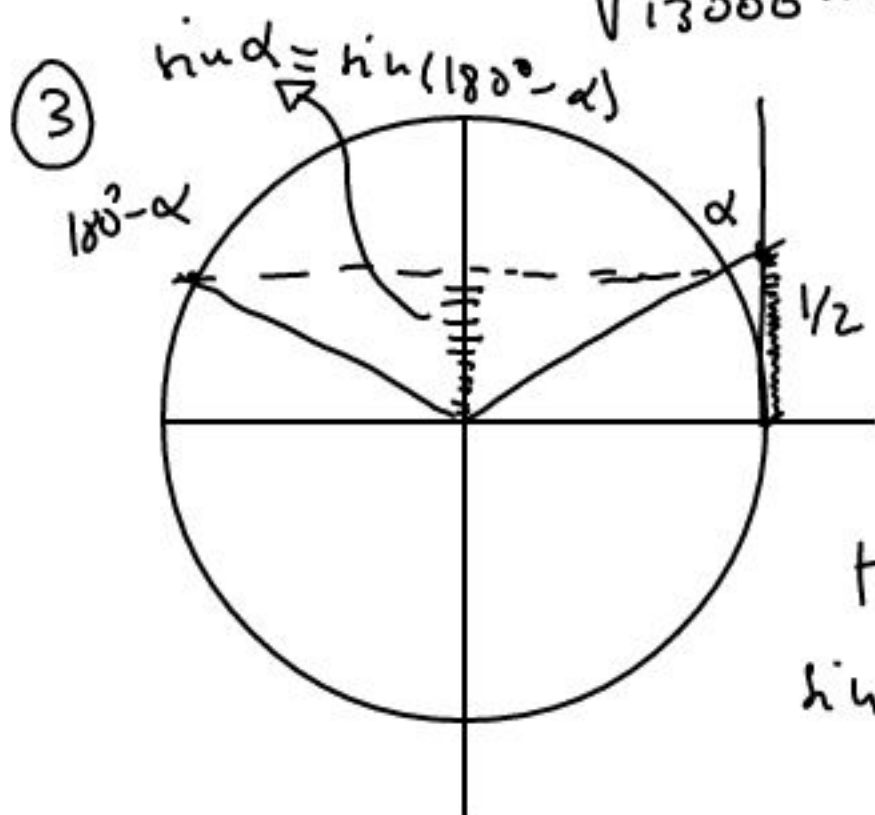
$$x = 10 \sqrt{130 - 63\sqrt{2}} \approx 10 \sqrt{40,9045} \approx \underline{63,957 \text{ km}}$$

t = temps que ha de passar:

$$100^2 = (70t)^2 + (90t)^2 - 2 \cdot 70t \cdot 90t \cos 45^\circ$$

$$100^2 = 13000t^2 - 6300\sqrt{2} \cdot t^2 = (13000 - 6300\sqrt{2})t^2$$

$$t = \frac{100}{\sqrt{13000 - 6300\sqrt{2}}} = 1,563558785 \text{ h} = \underline{1 \text{ h } 33 \text{ min } 48,81 \text{ s}}$$



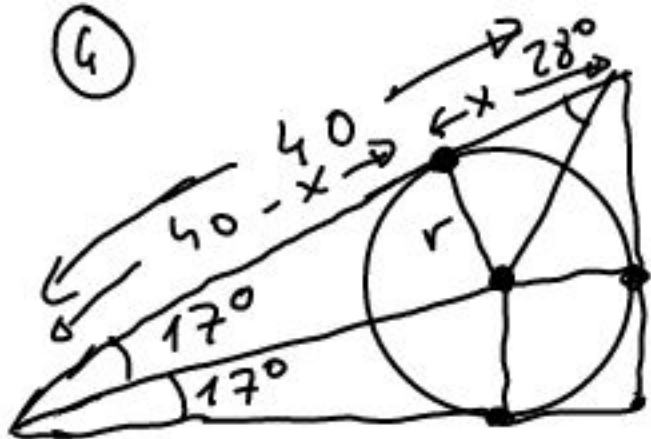
$$\sin(180^\circ - \alpha) = \sin \alpha = \tan \alpha \cdot \cos \alpha$$

$$= \frac{1}{2} \cdot \frac{1}{\sqrt{1 + (1/2)^2}} = \frac{1}{2} \cdot \frac{1}{\sqrt{5}/2}$$

$$= \frac{2}{2\sqrt{5}} = \frac{1}{\sqrt{5}} = \frac{\sqrt{5}}{5}$$

$$\tan \alpha = \frac{1}{2} \Rightarrow \alpha = \arctan\left(\frac{1}{2}\right) = 26^\circ 33' 54,18''$$

$$\sin(180^\circ - \alpha) = \sin(153^\circ 26' 5,82'') = \underline{0,4472135955}$$



$$\tan 17^\circ = \frac{r}{40-x}$$

$$\tan 28^\circ = \frac{r}{x}$$

$$\left\{ \begin{array}{l} x \tan 28^\circ = (40-x) \tan 17^\circ \\ x = \frac{40 \tan 17^\circ}{\tan 28^\circ + \tan 17^\circ} \end{array} \right.$$

$$r = \tan 28^\circ \cdot x = \frac{40 \tan 17^\circ \tan 28^\circ}{\tan 17^\circ + \tan 28^\circ} \approx 7,765 \text{ m}$$

⑤ a)

$$5x^2 + 2x - 3 = 0$$

$$x = \frac{-2 \pm \sqrt{4 + 60}}{10} = \frac{-2 \pm 8}{10} = \begin{cases} \frac{6}{10} = \frac{3}{5} \\ -\frac{10}{10} = -1 \end{cases}$$

b)

$$\begin{cases} x = 3y + 4 \\ 4x - 12y = 8 \end{cases} \Rightarrow 12y + 16 - 12y = 8 \Rightarrow 16 = 8$$

Contradicció!

Si tinguéssim solució passaria que $16 = 8$ i això no pot ser, per tant no té solució

c)

$$x + \sqrt{5 - 16x^2} = \frac{1}{2} \Leftrightarrow 2x - 1 = -2\sqrt{5 - 16x^2}$$

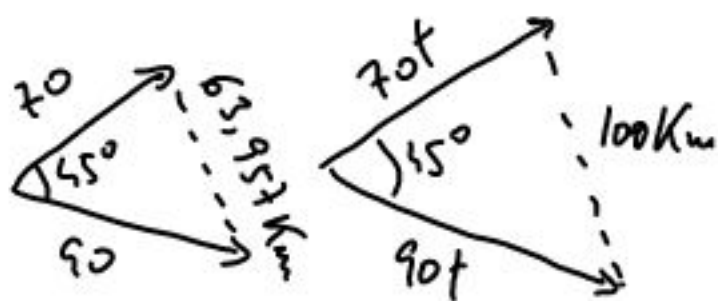
$$4x^2 - 4x + 1 = 4(5 - 16x^2) \Leftrightarrow 68x^2 - 4x - 19 = 0$$

no és bona

$$x = \frac{2 \pm \sqrt{4 + 1292}}{68} = \frac{2 \pm \sqrt{1296}}{68} = \frac{2 \pm 36}{68} = \begin{cases} \frac{19}{34} \rightarrow \text{bona} \\ -\frac{1}{2} \end{cases}$$

Alternativa a la 2a pregunta de la qüestió ②

Si $t =$ temps que ha de passar per tal que la reparació sigui 100 Kw, resulta que el triangle adjunt són semblants perquè tenen un angle de 45° igual i els costats $70, 90$ i $70t, 90t$ proporcionals.



$$\frac{100}{63,957} = \frac{70t}{70} = t \Rightarrow t \approx 1,563558785 \text{ h}$$

$$t \approx 1 \text{ h } 33 \text{ min } 48,815 \text{ s}$$

$$10\sqrt{130 - 63\sqrt{2}}$$