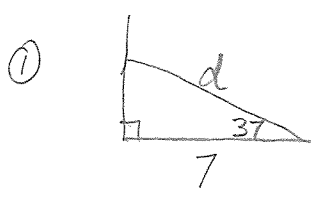


KEY - Applications of Trig - More Practice

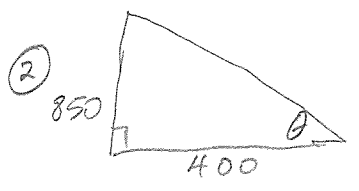


$$\cos 37 = \frac{7}{d}$$

$$d = \frac{7}{\cos 37}$$

$$d \approx 8.76$$

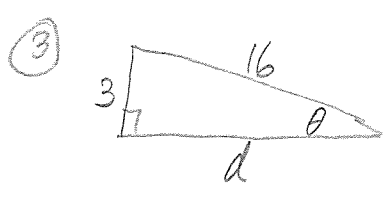
$$d \approx 8.8 \text{ feet}$$



$$\tan \theta = \frac{850}{400}$$

$$\theta \approx 64.798$$

$$\text{angle of elev} \approx 64.8^\circ$$



$$3^2 + d^2 = 16^2$$

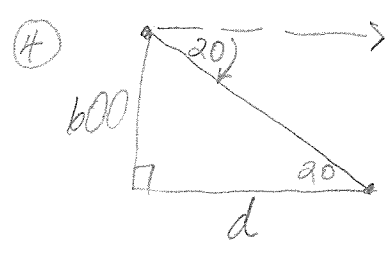
$$d \approx 15.716$$

$$d \approx 15.7 \text{ ft.}$$

$$\sin \theta = \frac{3}{16}$$

$$\theta \approx 10.8069$$

$$\text{ramp angle} \approx 10.8^\circ$$

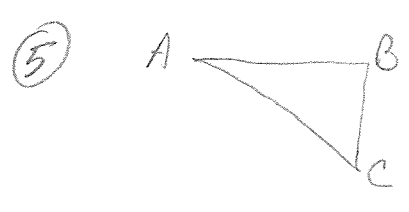


$$\tan 20 = \frac{600}{d}$$

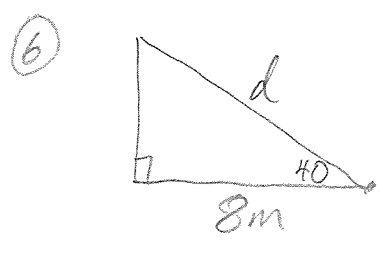
$$d = \frac{600}{\tan 20}$$

$$d \approx 1648.486$$

$$d \approx 1648.5 \text{ ft.}$$



∠A : angle of depression
 ∠B : neither
 ∠C : neither

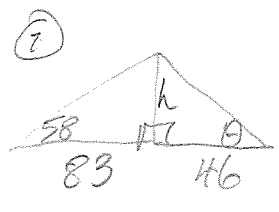


$$\cos 40 = \frac{8}{d}$$

$$d = \frac{8}{\cos 40}$$

$$d \approx 10.4433$$

$$d \approx 10.4 \text{ m}$$

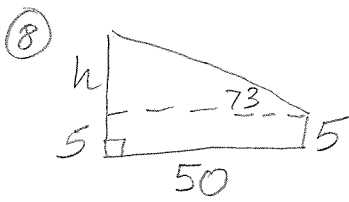


a) $\tan 58 = \frac{h}{83}$

$$h \approx 132.8 \text{ ft.}$$

b) $\tan \theta = \frac{132.8278}{46}$

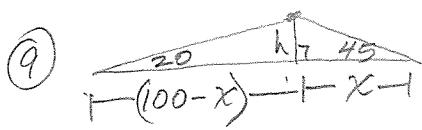
$$\theta \approx 70.9^\circ$$



$$\tan 73 = \frac{h}{50}$$

$$h \approx 163.5426$$

Building is
168.5 ft.



$$\tan 45 = \frac{h}{x} \quad \tan 20 = \frac{h}{100-x}$$

$$x \tan 45 = h \quad (100-x) \tan 20 = h$$

$$x \tan 45 = 100 \tan 20 - x \tan 20$$

$$x \tan 45 + x \tan 20 = 100 \tan 20$$

$$x(\tan 45 + \tan 20) = 100 \tan 20$$

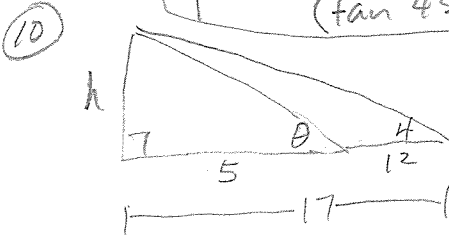
$$x = \frac{100 \tan 20}{(\tan 45 + \tan 20)} \approx 26.6846$$

$$\left. \begin{aligned} x \tan 45 &= h \\ (26.6846) \tan 45 &= h \end{aligned} \right\}$$

26.7 ft. \approx h

$$h = \frac{100(\tan 20)(\tan 45)}{(\tan 45 + \tan 20)}$$

← exact answer.



$$\tan 4 = \frac{h}{17}$$

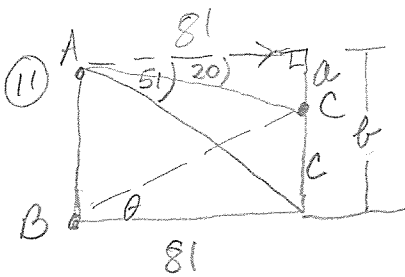
$$h \approx 1.1888$$

mile

$$\tan \theta = \frac{1.1888}{5}$$

$$\theta \approx 13.37$$

Angle of elev. $\approx 13.4^\circ$



$$\tan 20 = \frac{a}{81}$$

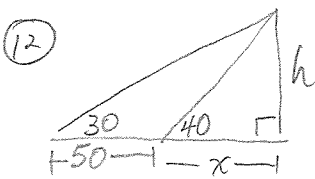
$$a \approx 29.4816$$

$$\tan 51 = \frac{b}{81}$$

$$\tan \theta = \frac{70.5451}{81}$$

$$b \approx 100.0267 \quad \theta \approx 41.05$$

$$c \approx 70.5451 \quad \text{Angle} \approx 41.1^\circ$$



$$\tan 40 = \frac{h}{x} \rightarrow x \tan 40 = h$$

$$\tan 30 = \frac{h}{50+x}$$

$$\downarrow$$

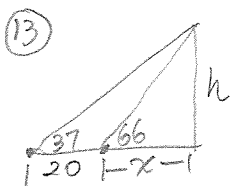
$$(50+x) \tan 30 = h$$

$$x \tan 40 = 50 \tan 30 + x \tan 30$$

$$x \tan 40 - x \tan 30 = 50 \tan 30$$

$$x(\tan 40 - \tan 30) = 50 \tan 30$$

$$x = \frac{50 \tan 30}{(\tan 40 - \tan 30)}$$



$$\tan 66 = \frac{h}{x} \quad \left\{ \begin{aligned} x \tan 66 &= h \\ 22.6805 &\approx h \end{aligned} \right.$$

$$x \tan 66 = 20 \tan 37 + x \tan 37$$

$$x \tan 66 - x \tan 37 = 20 \tan 37$$

$$x(\tan 66 - \tan 37) = 20 \tan 37$$

$$x = \frac{20 \tan 37}{(\tan 66 - \tan 37)}$$

$$x \approx 10.09799$$

exact

$$h = \frac{20(\tan 37)(\tan 66)}{(\tan 66 - \tan 37)}$$

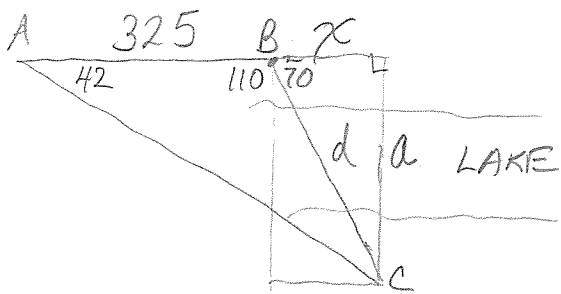
rocket
 $\approx 23m$

$$\frac{50(\tan 30)(\tan 40)}{(\tan 40 - \tan 30)} = h$$

$$92.5417 \approx h$$

Building ≈ 92.5 ft.

14



$$\tan 42 = \frac{a}{325+x} \quad \tan 70 = \frac{a}{x}$$

$$(325+x) \tan 42 = a \quad x \tan 70 = a$$

$$325 \tan 42 + x \tan 42 = x \tan 70$$

$$325 \tan 42 = x \tan 70 - x \tan 42$$

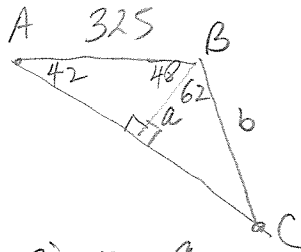
$$325 \tan 42 = x (\tan 70 - \tan 42)$$

$$\frac{325 \tan 42}{(\tan 70 - \tan 42)} = x$$

$$\frac{325 (\tan 42) (\tan 70)}{(\tan 70 - \tan 42)} = a$$

$$435.2821 \approx a$$

OR



$$\sin 42 = \frac{a}{325} \rightarrow a \approx 217.5$$

$$\cos 62 = \frac{a}{b}$$

$$b = \frac{a}{\cos 62}$$

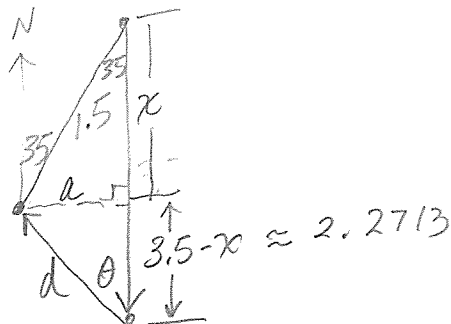
$$b \approx 463.2 \text{ ft.}$$

$$\sin 70 = \frac{435.2821}{d}$$

$$d \approx 463.2175$$

$$\boxed{BC \approx 463.2 \text{ ft.}}$$

15



$$\sin 35 = \frac{a}{1.5}$$

$$a \approx 0.8604 \text{ km}$$

$$\cos 35 = \frac{x}{1.5}$$

$$x \approx 1.2287 \text{ km}$$

$$\tan \theta = \frac{a}{(3.5-x)}$$

$$\tan \theta = \frac{0.8604}{2.2713}$$

$$\theta \approx 20.7474^\circ$$

$$\cos 20.7474 = \frac{2.2713}{d}$$

$$d \approx 2.4288$$

He must walk about 2.4 km.

Bearing: N 20.7° W