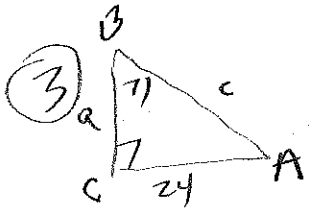


§4.8 Word Problems

p 359 # 3, 8, 17, 21, 26, 31, 34, 37, 42, 60



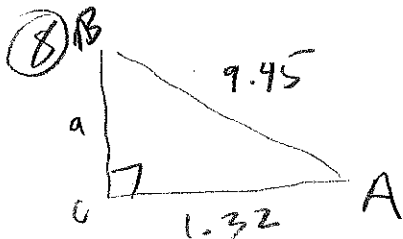
$$\sin 71^\circ = \frac{24}{c}$$

$$c = \frac{24}{\sin 71^\circ} \approx 25.38$$

$$\tan 71^\circ = \frac{24}{a}$$

$$a = \frac{24}{\tan 71^\circ} \approx 8.26$$

$$A = 180 - 90 - 71 = 19^\circ$$



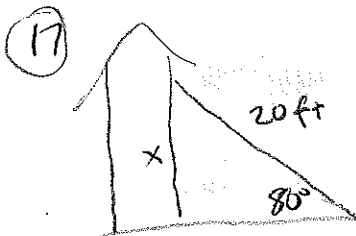
$$\sin B = \frac{1.32}{9.45}$$

$$B = \arcsin\left(\frac{1.32}{9.45}\right) \approx 8.03^\circ$$

$$\cos A = \frac{1.32}{9.45}$$

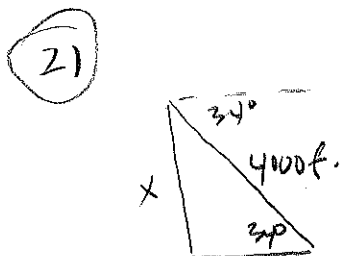
$$A = \arccos\left(\frac{1.32}{9.45}\right) \approx 81.97^\circ$$

$$a = \sqrt{(9.45)^2 - (1.32)^2} \approx 9.36$$



$$\sin 80^\circ = \frac{x}{20}$$

$$x = 20 \sin 80^\circ \approx 19.7 \text{ ft.}$$

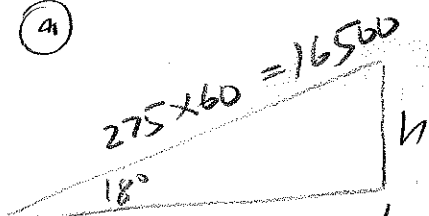


$$\sin 34^\circ = \frac{x}{4000}$$

$$x = 4000 \sin 34^\circ \approx 2,236.77 \text{ ft deep}$$

26

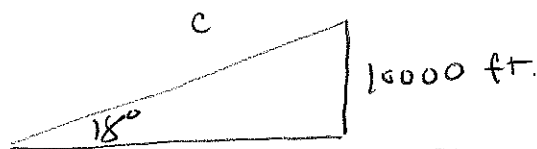
(a)



$$\sin 18^\circ = h / 16,500$$

$$\Rightarrow h = 16,500 \sin 18^\circ \approx 5,098.78 \text{ ft.}$$

(b)



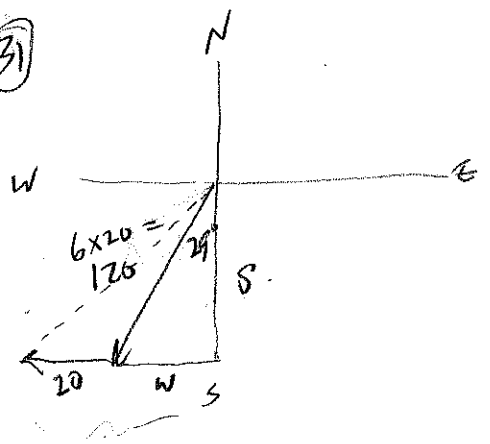
$$\sin 18^\circ = \frac{10000}{c}$$

$$c = \frac{10000}{\sin 18^\circ} \approx 32,361 \text{ ft}$$

$$32,361 / 275 \approx 118 \text{ secs}$$

$$\approx 2 \text{ min}$$

31



$$a) \cos 29^\circ = \frac{S}{120} \Rightarrow S = 120 \cos 29^\circ \approx 104.95 \text{ nm}$$

$$\sin 29^\circ = \frac{W}{120} \Rightarrow W = 120 \sin 29^\circ \approx 58.18 \text{ nm}$$

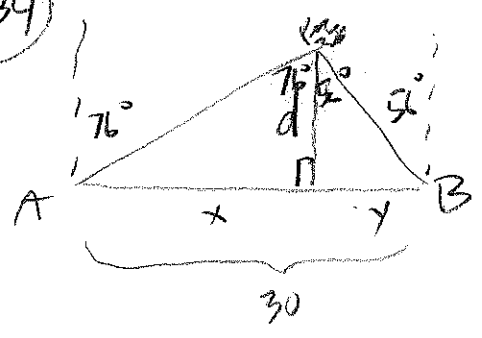
$$b) \text{dist.} = \sqrt{(104.95)^2 + (58.18 + 20)^2} \approx 130.87 \text{ nm}$$

$$\tan \theta = \frac{58.18 + 20}{104.95}$$

$$\theta = \arctan(\dots) \approx 36.68^\circ$$

Bearing: S 36.68° W

34



$$x + y = 30 \Rightarrow x = 30 - y$$

$$\tan 56^\circ = \frac{y}{d} \Rightarrow d = \frac{y}{\tan 56}$$

$$\tan 76^\circ = \frac{x}{d} \Rightarrow d = \frac{x}{\tan 76}$$

$$\frac{y}{\tan 56^\circ} = \frac{30 - y}{\tan 76^\circ}$$

$$y \tan 76^\circ = 30 \tan 56^\circ - y \tan 56^\circ$$

$$y \tan 76^\circ + y \tan 56^\circ = 30 \tan 56^\circ$$

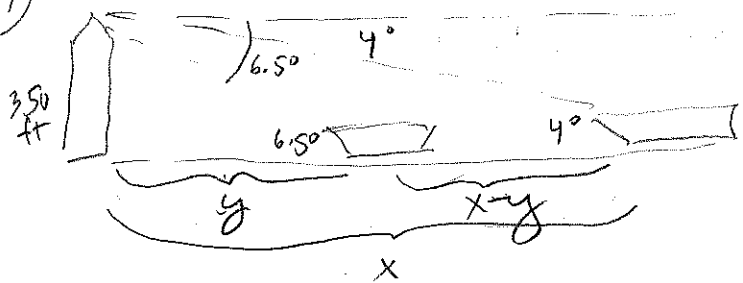
$$y (\tan 76^\circ + \tan 56^\circ) = 30 \tan 56^\circ$$

$$y = \frac{30 \tan 56^\circ}{\tan 76^\circ + \tan 56^\circ} \approx 8.1$$

$$d \approx \frac{8.1}{\tan 56}$$

$$\approx 5.46 \text{ km}$$

37



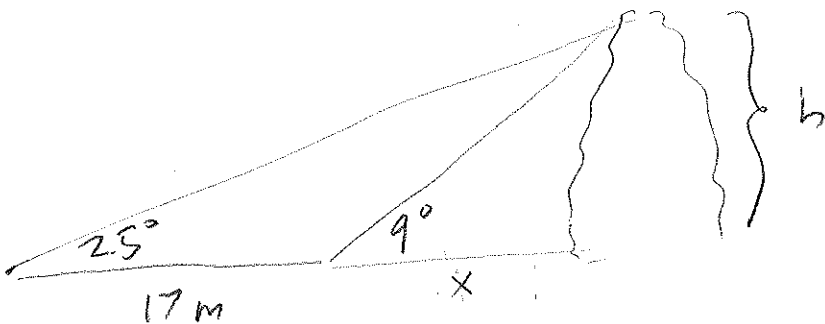
$$x - y = 5005.23 - 3071.91$$

$$\approx 1,933.32 \text{ ft.}$$

$$\tan 6.5^\circ = \frac{350}{y} \Rightarrow y = \frac{350}{\tan 6.5^\circ} \approx 3,071.91 \text{ ft}$$

$$\tan 4^\circ = \frac{350}{x} \Rightarrow x = \frac{350}{\tan 4^\circ} \approx 5,005.23 \text{ ft}$$

40



$$\tan 2.5^\circ = \frac{h}{x+17} \Rightarrow h = (x+17)(\tan 2.5^\circ)$$

$$\tan 9^\circ = \frac{h}{x} \Rightarrow h = x \tan 9^\circ$$

$$x \tan 2.5^\circ + 17 \tan 2.5^\circ = x \tan 9^\circ$$

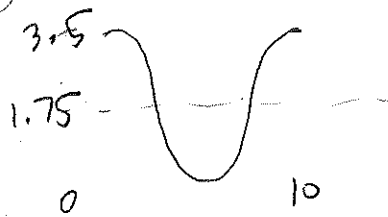
$$17 \tan 2.5^\circ = x \tan 9^\circ - x \tan 2.5^\circ$$

$$17 \tan 2.5^\circ = x (\tan 9^\circ - \tan 2.5^\circ)$$

$$x = \frac{17 \tan 2.5^\circ}{\tan 9^\circ - \tan 2.5^\circ} \approx 6.47 \text{ m}$$

$$h = \left(\frac{17 \tan 2.5^\circ}{\tan 9^\circ - \tan 2.5^\circ} \right) \tan 9^\circ \approx 1.025 \text{ m}$$

60



Period = 10 s

$$1.75 \cos \frac{\pi}{5} t$$

$$10 = \frac{2\pi}{\omega}$$

$$\omega = \frac{2\pi}{10} = \frac{\pi}{5}$$