

7.1 HW Solutions

$$23.) \underbrace{1 - \cos^2 20^\circ} - \cos^2 70^\circ$$

$$\sin^2 20^\circ - \cos^2 70^\circ$$

$$\cos^2 70^\circ - \cos^2 70^\circ = \boxed{0}$$

$$\begin{aligned} \cdot \sin^2 20^\circ &= \cos^2(90-20) \\ &= \cos^2(70) \end{aligned}$$

$$25.) \tan 20^\circ - \frac{\cos 70^\circ}{\cos 20^\circ} \rightarrow \tan 20^\circ - \frac{\sin(90-70)}{\cos 20^\circ}$$

$$= \tan 20^\circ - \frac{\sin 20^\circ}{\cos 20^\circ}$$

$$= \tan 20^\circ - \tan 20^\circ = \boxed{0}$$

$$27.) \cos 35^\circ \sin 35^\circ + \sin 35^\circ \cos 55^\circ$$

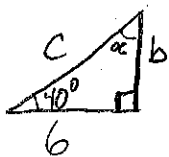
$$\cos 35^\circ \cos(90-55) + \sin 35^\circ \sin(90-55)$$

$$\cos 35^\circ \cos 35^\circ + \sin 35^\circ \sin 35^\circ$$

$$\cos^2 35^\circ + \sin^2 35^\circ = \boxed{1}$$

$$\cdot \sin^2 x + \cos^2 x = 1$$

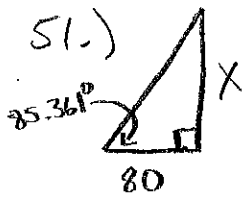
$$31.) a = 6, B = 40^\circ, \text{ find } b, c, \text{ \& } \alpha$$



$$\cdot \alpha = 90 - 40 = \underline{50^\circ}$$

$$\cdot \sin 40^\circ = \frac{b}{6} \rightarrow b = 6 \sin 40^\circ \approx \underline{5.03}$$

$$\cdot \sin 50^\circ = \frac{6}{c} \rightarrow c = \frac{6}{\sin 50^\circ} \approx \underline{7.83}$$

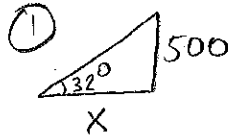
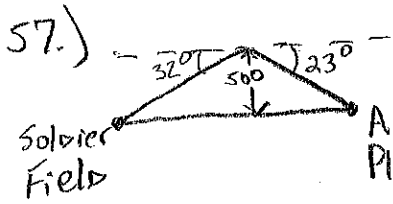


$$\tan 85.361 = \frac{X}{80}$$

* multiply each side by 80 to get:

$$80 \tan 85.361^\circ = X$$

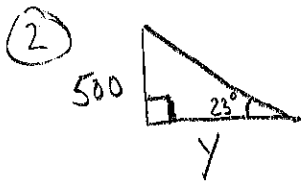
Height of the Eiffel Tower \rightarrow $985.91 \text{ Ft} = X$



$$\tan 32^\circ = \frac{500}{X}$$

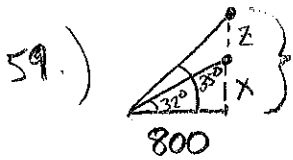
$$X = \frac{500}{\tan 32^\circ} = 800.17 \text{ Ft}$$

* separate into 2 right Δ 's
 \rightarrow Alternate interior angles are congruent



$$\tan 23^\circ = \frac{500}{Y} \rightarrow Y = \frac{500}{\tan 23^\circ} = 1177.93 \text{ Ft}$$

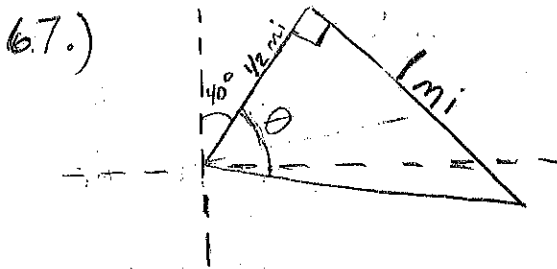
③ $x + y = 800.17 + 1177.93 =$ 1978.1 Ft distance from soldier field to the Adler Planetarium



$$\tan 35^\circ = \frac{y}{800} \rightarrow y = 800 \tan 35^\circ = 560.17 \text{ Ft}$$

$$\tan 32^\circ = \frac{x}{800} \rightarrow x = 800 \tan 32^\circ = 499.9 \text{ Ft}$$

• Height of Lincoln's face (Z) = $y - x = 560.17 - 499.9$
 $= 60.27 \text{ Ft}$



$$\tan \theta = \frac{1}{\frac{1}{2}} \rightarrow \tan \theta = 2$$

$$\theta = \tan^{-1}(2) = 63.4$$

$$63.44 + 40 = 103.4^\circ$$

$$180 - 103.4 = 76.6^\circ$$

Direction: $S 76.6^\circ E$