

Pp. 10-11; 8, 10-14, 18-19 Answer Key

8.  $x=17, y=18, z=30$  ↙ start here!  
SSS-LOC

$$30^2 = 17^2 + 18^2 - 2(17)(18)\cos Z$$

$$287 = -612\cos Z$$

$$\cos Z = \frac{287}{-612} \quad \angle Z = \cos^{-1}(\text{ANS}) = 118.0^\circ$$

$$\begin{aligned} \angle Z &= 118.0^\circ \\ m\angle X &= 30.0^\circ \\ m\angle Y &= 32.0^\circ \end{aligned}$$

Solve for  $\angle X$  or  $\angle Y$ .

$$\frac{17}{\sin X} = \frac{30}{\sin 118^\circ}$$

$$\sin X = \frac{17\sin 118^\circ}{30} \rightarrow m\angle X = \sin^{-1}(\text{ANS}) = 30.0^\circ$$

10.  $d=9, m\angle E=94^\circ, f=18$  SAS-LOC

$$e^2 = 9^2 + 18^2 - 2(9)(18)\cos 94^\circ$$

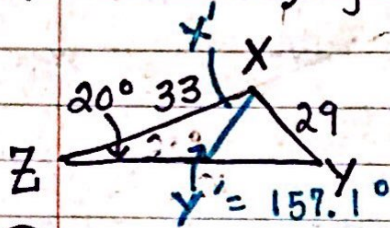
$$e = \sqrt{\text{ANS}} \approx 20.$$

$$\begin{aligned} e &= 20.7 \\ m\angle D &= 25.7^\circ \\ m\angle F &= 60.3^\circ \end{aligned}$$

$$\frac{20.7}{\sin 94^\circ} = \frac{9}{\sin D} \rightarrow \sin D = \frac{9\sin 94^\circ}{20.7} \quad m\angle D = \sin^{-1}(\text{ans}) = 25.7^\circ$$



11)  $m\angle Z = 20^\circ$ ,  $y = 33$ ,  $z = 29$  SSA: 0, 1, or 2



①  $\frac{29}{\sin 20^\circ} = \frac{33}{\sin Y}$   $\sin Y = \frac{33 \sin 20^\circ}{29}$

③  $\frac{x}{\sin 137.1^\circ} = \frac{29}{\sin 20^\circ}$   
 $x = \frac{29 \sin 137.1^\circ}{\sin 20^\circ} = 57.7$

$m\angle Y = 22.9^\circ$  ✓  
 ②  $m\angle X = 137.1^\circ$  ✓  $\Delta 1$   
 $x = 57.7$  cm  
 $m\angle Y' = 157.1^\circ$  ✓  
 $m\angle X' = 2.9^\circ$  ✓  $\Delta 2$   
 $x' = 4.3$  cm

④ 2<sup>nd</sup> Triangle?

$m\angle Y' = 180 - 22.9 = 157.1^\circ$  Since  $20^\circ + 157.1^\circ < 180^\circ$

⑤  $m\angle X' = 2.9^\circ$

There is a 2<sup>nd</sup>  $\Delta$ .

⑥  $\frac{\text{side } x'}{\sin 2.9^\circ} = \frac{29}{\sin 20^\circ}$   $x' = \frac{29 \sin 2.9^\circ}{\sin 20^\circ} = 4.3$

12)  $m\angle P = 38^\circ$ ,  $m\angle R = 136.3^\circ$ ,  $q = 4$  m ASA, LOS, 1  $\Delta$

$\frac{4}{\sin 5.7} = \frac{p}{\sin 38^\circ}$   $\frac{4}{\sin 5.7} = \frac{r}{\sin 136.3}$   
 $p = \frac{4 \sin 38^\circ}{\sin 5.7}$   $r = \frac{4 \sin 136.3}{\sin 5.7}$   
 $p = 24.8$   $r = 27.8$

$m\angle Q = 5.7^\circ$  ✓  
 $p = 24.8$  m ✓  
 $r = 27.8$  m

13.  $m\angle E = 112^\circ$ ,  $d = 38$  m,  $e = 23$  m SSA - LOS

$\frac{23}{\sin 112^\circ} = \frac{38}{\sin D}$

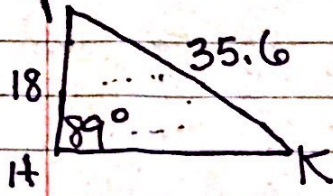
$\sin D = 1.532$  Too big!

$\sin D = \frac{38 \sin 112^\circ}{23}$

No  $\Delta$  is formed. ✓



14)  $m\angle H = 89^\circ$ ,  $K = 18$ ,  $h = 35.6$  in. SSA-LOS



$$\textcircled{1} \frac{35.6}{\sin 89^\circ} = \frac{18}{\sin K}$$

$$\sin K = \frac{18 \sin 89^\circ}{35.6}$$

$$m\angle K = 30.4^\circ$$

$$m\angle P = 60.6^\circ \checkmark$$

$$p = 31.0 \text{ in.}$$

$$m\angle K = \sin^{-1}(\text{ANS}) = 30.4^\circ \quad m\angle P = 60.6^\circ$$

$$\frac{35.6}{\sin 89^\circ} = \frac{p}{\sin 60.6^\circ} \quad p = \frac{35.6 \sin 60.6^\circ}{\sin 89^\circ}$$

18.  $m\angle B = 112.5^\circ$ ,  $m\angle C = 18.5^\circ$ ,  $a = 26.1$  cm ASA-LOS

$$\frac{26.1}{\sin 49^\circ} = \frac{b}{\sin 112.5^\circ} \quad \frac{26.1}{\sin 49^\circ} = \frac{c}{\sin 18.5^\circ}$$

$$m\angle A = 49^\circ \checkmark$$

$$b = 32.0 \text{ cm}$$

$$c = 11.0 \text{ cm}$$

$$b = \frac{26.1 \sin 112.5^\circ}{\sin 49^\circ} \quad c = \frac{26.1 \sin 18.5^\circ}{\sin 49^\circ}$$

$$= 32.0$$

19.  $m\angle C = 74.3^\circ$ ,  $m\angle A = 17.7^\circ$ ,  $c = 38$  ft AAS-LOS

$$\frac{38}{\sin 74.3^\circ} = \frac{a}{\sin 17.7^\circ} \quad \frac{38}{\sin 74.3^\circ} = \frac{b}{\sin 88^\circ}$$

$$m\angle B = 88^\circ \checkmark$$

$$a = 12.0 \text{ ft}$$

$$b = 39.4 \text{ ft}$$

$$a = \frac{38 \sin 17.7^\circ}{\sin 74.3^\circ} \quad b = \frac{38 \sin 88^\circ}{\sin 74.3^\circ}$$

$$a = 12.0 \quad b = 39.4$$