Unit 1 Review Answers

4. First do the Pythagorean Theorem to get the third side.

$$\begin{aligned} 7^2 + x^2 &= 18^2 \\ 49 + x^2 &= 324 \\ x^2 &= 275 \\ x &= \sqrt{275} = 5\sqrt{11} \end{aligned}$$

Second, use one of the inverse functions to find the two missing angles.

$$\begin{aligned} \sin G &= \frac{7}{18} \\ \sin^{-1}\left(\frac{7}{18}\right) &= G \\ G &\approx 22.89^\circ \end{aligned}$$

We can subtract $\angle G$ from 90 to get 67.11°.

6. Make a right triangle with 165 as the opposite leg and w is the hypotenuse.

$$\begin{aligned} \sin 85^\circ &= \frac{165}{w} \\ w \sin 85^\circ &= 165 \\ w &= \frac{165}{\sin 85^\circ} \\ w &\approx 165.63 \end{aligned}$$

8. If $\cos(-x) = \frac{3}{4}$, then $\cos x = \frac{3}{4}$. With $\tan x = \frac{\sqrt{7}}{3}$, we can conclude that $\sin x = \frac{\sqrt{7}}{4}$ and $\sin(-x) = -\frac{\sqrt{7}}{4}$.

10. $\sin\theta = \frac{1}{3}$, sine is positive in Quadrants I and II. So, there can be two possible answers for the $\cos\theta$. Find the third side, using the Pythagorean Theorem:

$$\begin{aligned} 1^2 + b^2 &= 3^2 \\ 1 + b^2 &= 9 \\ b^2 &= 8 \\ b &= \sqrt{8} = 2\sqrt{2} \end{aligned}$$

In Quadrant I, $\cos\theta = \frac{2\sqrt{2}}{3}$ In Quadrant II, $\cos\theta = -\frac{2\sqrt{2}}{3}$

12. If the terminal side of θ is on (3, -4) means θ is in Quadrant IV, so cosine is the only positive function. Because the two legs are lengths 3 and 4, we know that the hypotenuse is 5. 3, 4, 5 is a Pythagorean Triple (you can do the Pythagorean Theorem to verify). Therefore, $\sin\theta = \frac{3}{5}, \cos\theta = -\frac{4}{5}, \tan\theta = -\frac{4}{3}$