Unit 1 Review Answers

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

\[ 7^2 + x^2 = 18^2 \]
\[ 49 + x^2 = 324 \]
\[ x^2 = 275 \]
\[ x = \sqrt{275} = 5\sqrt{11} \]

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

\[ \sin G = \frac{7}{18} \]
\[ \sin^{-1} \left( \frac{7}{18} \right) = G \]
\[ G \approx 22.89^\circ \]

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.

\[ \sin 85^\circ = \frac{165}{w} \]
\[ w \sin 85^\circ = 165 \]
\[ w = \frac{165}{\sin 85^\circ} \]
\[ w \approx 165.63 \]

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. \( \sin \theta = \frac{1}{2} \), 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:

\[ 1^2 + b^2 = 3^2 \]
\[ 1 + b^2 = 9 \]
\[ b^2 = 8 \]
\[ b = \sqrt{8} = 2\sqrt{2} \]

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 \( \theta \) is on \( (3, -4) \) means \( \theta \) 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, \( \sin \theta = \frac{3}{5} \), \( \cos \theta = -\frac{4}{5} \), \( \tan \theta = -\frac{3}{4} \)