Getting Started

1. Solve for \( n \).
   a) \[ \frac{n}{12} = \frac{3}{2} \]
   \[ 12 \left( \frac{n}{12} \right) = 12 \left( \frac{3}{2} \right) \]
   \[ n = 18 \]
   b) \[ \frac{n}{6} = \frac{5}{4} \]
   \[ n = 7.5 \]

2. Three trigonometric ratios are sine, cosine, and tangent. Record each trigonometric ratio below.
   a) \( \text{tangent} : \) opposite \( \quad \) adjacent
   b) \( \text{cosine} : \) adjacent \( \quad \) hypotenuse
   c) \( \text{sine} : \) opposite \( \quad \) hypotenuse

3. Solve for \( c \), to one decimal place.
   a) \( \sin 35^\circ = \frac{c}{8.0} \)
   \[ 8.0 \left( \sin 35^\circ \right) = 8.0 \left( \frac{c}{8.0} \right) \]
   \[ c = 4.588... = c, \text{ or } c = 4.6 \text{ units} \]
   b) \( \cos 50^\circ = \frac{12.0}{c} \)
   \[ c \left( \cos 50^\circ \right) = c \left( \frac{12.0}{c} \right) \]
   \[ c = \frac{12.0}{\cos 50^\circ} \]
   \[ c = 18.668..., \text{ or } c = 18.7 \text{ units} \]

4. What is the measure of each angle?
   a) \( \angle A = \sin^{-1}(0.8660) \)
   \[ \angle A = 59.997...^\circ, \text{ or } \angle A = 60^\circ \]
   b) \( \angle B = \cos^{-1}(0.7071) \)
   \[ \angle B = 45.000...^\circ, \text{ or } \angle B = 45^\circ \]

You will need
- a scientific calculator (You will be using trigonometric functions in most of this chapter.)

Hint
There are various ways to round. Chapter 2 shows how to use decimal places and significant digits. For Chapter 9, the number of decimal places in the answer should match the number of decimal places in the given data.

Hint
In this chapter, calculate angle measures to the nearest degree. This is the precision you get when measuring with a protractor.
5. What is the measure of each angle?

a) \( \sin A = \frac{5}{9} \)
\[ \angle A = \sin^{-1}\left(\frac{5}{9}\right) \]
\[ \angle A = 33.748\ldots^\circ \], or \( 34^\circ \)

b) \( \cos B = \frac{3.5}{8.3} \)
\[ \angle B = \cos^{-1}\left(\frac{3.5}{8.3}\right) \]
\[ \angle B = 65.058\ldots^\circ \], or \( 65^\circ \)

c) \( \sin C = 0.9898 \)
\[ \angle C = \sin^{-1}(0.9898) \]
\[ \angle C = 81.809\ldots^\circ \], or \( 82^\circ \)

6. What are the missing angle measures in these triangles?
Record the angle measures on the diagrams.

a) \( \angle A = 62^\circ \)
\( \angle B = 36^\circ \)
\( \angle C = 82^\circ \)

b) \( \angle P = 54^\circ \)
\( \angle Q = 63^\circ \)
\( \angle R = 63^\circ \)

c) \( \angle X = 50^\circ \)
\( \angle Y = 40^\circ \)
\( \angle Z = 81^\circ \)

7. Record the given side lengths on the diagrams.

a) The side lengths are 2.5 m, 4.3 m, and 5 m.

b) The side lengths are 3.1 mi, 3.7 mi, and 4.4 mi.

8. Record the side lengths for \( \triangle ABC \) at the right.
side \( a = 10.0 \text{ m} \)  side \( b = 11.2 \text{ m} \)  side \( c = 5.4 \text{ m} \)

9. Marla is leaning a 16 ft ladder against a house, as shown at the right. The \textbf{angle of elevation} is 70°. How high does the ladder reach?

\[ \sin 70^\circ = \frac{h}{16} \]
\[ \frac{16}{\sin 70^\circ} = h \]
\[ 15.035\ldots = h \]

The ladder reaches 15 ft.