Chapter 8 Review

8.1 The Sine Law, pages 396–404

1. Find the length of \( x \), to the nearest centimetre.

\[
\begin{align*}
x & \quad 12 \text{ cm} \\
Y & \quad 70^\circ \\
X & \quad 55^\circ \\
Z &
\end{align*}
\]

2. Find the measure of \( \angle P \), to the nearest degree.

3. Solve each triangle. Round answers to the nearest unit, if necessary.
   a) In acute \( \triangle NRC \), \( \angle N = 47^\circ \), \( \angle R = 80^\circ \),
      and \( r = 27 \text{ mm} \).
   b) In acute \( \triangle EQW \), \( \angle W = 77^\circ \), \( e = 11 \text{ km} \),
      and \( q = 14 \text{ km} \).

4. Three billiard balls are lying as shown.

The white cue ball is 55 cm from the red ball and 62 cm from the black ball. The line segment from the red ball to the white ball and the line segment from the red ball to the black ball form an angle of 82°.
   a) How far apart are the red and black balls, to the nearest centimetre?
   b) Find the measures of the other angles in the triangle formed by these three billiard balls, to the nearest degree.

8.2 The Cosine Law, pages 405–411

5. Find the length of \( t \), to the nearest metre.

6. Solve each triangle. Round answers to the nearest unit, if necessary.
   a)
   b) In acute \( \triangle EQW \), \( \angle W = 77^\circ \), \( e = 11 \text{ km} \),
      and \( q = 14 \text{ km} \).

7. Lucy’s space shuttle is 35 km from her mother ship and 42 km from a space station. From Lucy’s point of view, the mother ship and space station appear to be 49° apart, as shown.
   a) How far apart are the mother ship and the space station, to the nearest kilometre?
   b) From the space station, by what angle do the shuttle and mother ship appear to be separated, to the nearest degree?
8.3 Find Angles Using the Cosine Law, pages 412–419

8. Find the measure of \( \angle B \), to the nearest degree.

9. Solve each triangle. Round answers to the nearest tenth of a degree.
   a) In acute \( \triangle VSF \), \( v = 2.9 \text{ km}, s = 3.5 \text{ km}, \) and \( f = 3.0 \text{ km} \).
   b) In acute \( \triangle SBZ \), \( s = 19 \text{ m}, b = 21 \text{ m}, \) and \( z = 13 \text{ m} \).

10. While flying, a helicopter pilot spots a water tower that is 4.8 km away to the north. At the same time, she also sees a monument that is 5.6 km away to the south. The tower and the monument are separated by a distance of 7.0 km along the flat ground. Find the angles at which the pilot is viewing the water tower and the monument, to the nearest degree.

8.4 Solve Problems Using Trigonometry, pages 424–429

11. A person on the ground is directly between two helicopters that are flying toward each other at the same altitude. The first helicopter is 2.0 km away from the observer, at an angle of elevation of 30°, while the second helicopter is 3.5 km away. Round answers to the nearest tenth of a kilometre, if necessary.
   a) Draw a diagram and label the known information.
   b) How far apart are the helicopters?
   c) What is their altitude?

12. Percé Rock is located on the shore of the Gaspé Peninsula in Québec. The measurements shown were taken at low tide.

Find the height of Percé Rock, to the nearest metre.

Chapter Problem Wrap-Up

Congratulations! You have passed your first course at Fowler’s Aeronautical School. Your last assignment is to create an aeronautical problem of your own involving trigonometry for next year’s class. Once you have created the problem, solve it. Then, trade with a partner and solve each other’s problem.

If you are interested in finding the next steps you need to take in order to become a pilot, go to www.mcgrawhill.ca/links/principles10 and follow the links.