

- Determine  $\alpha$ , where  $0 < \alpha < 180^\circ$ , for each trigonometric ratio below. Round your answer to the nearest tenth of a degree.
  - $\cos \alpha = 0.235$
  - $\tan \alpha = 2.314$
  - $\sin \alpha = 0.015$
  - $\cos \alpha = -\frac{3}{4}$
  - $\sin \alpha = \frac{1}{2}$
  - $\sin \alpha = 0.600$
- For each description below, determine if there are zero, one, or two possible triangles. Draw the triangle(s), if possible, including the unknown measurements.
  - In  $\triangle DEF$ ,  $d = 5$  cm,  $e = 3$  cm, and  $f = 9$  cm.
  - In  $\triangle ABC$ ,  $\angle A = 25^\circ$ ,  $b = 3$  m, and  $c = 10$  m.
  - In  $\triangle JKL$ ,  $\angle J = 55^\circ$ ,  $j = 10.4$  km, and  $k = 11.6$  km.
  - In  $\triangle PQR$ ,  $\angle P = 17^\circ$ ,  $\angle Q = 110^\circ$ , and  $r = 26$  mm.
  - In  $\triangle FUN$ ,  $\angle F = 75^\circ$ ,  $f = 25$  cm, and  $n = 47$  cm.
- Two workers are helping a crane operator lower a crate to the ground. The workers are standing in line with the crate and each other. Each of them has a rope attached to the crate. The first worker has a 35 ft rope that makes an angle of  $50^\circ$  with the ground. The second worker has a 30 ft rope. Determine the distance, to the nearest foot, between the two workers.
- A vertical tree stands on the side of a ski run. The angle of inclination for the ski run measures  $40^\circ$ . When the angle of elevation of the Sun measures  $65^\circ$ , the tree casts a shadow 75.0 m down the slope. Determine the height of the tree, to the nearest tenth of a metre.
- $\triangle ABC$  is an equilateral triangle with a perimeter of 36 cm. Three triangles are created when  $\angle A$  is divided into three equal angles. Two of these triangles are obtuse. Determine the side lengths of the obtuse triangles, to the nearest centimetre.
- The following describes the location of a buried treasure. From the pine tree, walk 30 paces N $20^\circ$ E, then turn and walk 15 paces until the tree is due south. How many paces would you need to walk due north of the tree to reach the buried treasure?
- From the window of a building, 45 m up, the angles of depression to two different intersections measure  $76^\circ$  and  $65^\circ$ . The measure of the angle between the lines of sight to the two intersections is  $135^\circ$ . Calculate, to the nearest metre, the distance between the two intersections.

**WHAT DO You Think Now?** Revisit **What Do You Think?** on page 161. How have your answers and explanations changed?