

## Chapter 4 Review

BLM 4-10

## 4.1 Radian Measure

- Determine the approximate degree measure, to the nearest tenth, for each angle.
  - 3.62
  - 0.54
  - 5.43
  - 1.75
- Determine the approximate radian measure, to the nearest hundredth, for each angle.
  - $59^\circ$
  - $243^\circ$
  - $124^\circ$
  - $425^\circ$
- Determine the exact radian measure of each angle.
  - $125^\circ$
  - $80^\circ$
  - $16^\circ$
- An arc of a circle subtends a central angle of  $\frac{5\pi}{6}$  radians. If the radius of the circle measures 10.6 cm, determine the approximate measure of the arc length, to the nearest tenth of a centimetre.

## 4.2 Trigonometric Ratios and Special Angles

- Determine an exact value for each expression.
  - $\frac{\sin \frac{\pi}{6} \tan \frac{\pi}{3}}{\csc \frac{\pi}{4}}$
  - $\sec \frac{4\pi}{3} \cot \frac{5\pi}{6} - \tan \frac{3\pi}{4}$
- Shari and Leo are standing 36 m apart and facing each other. If Shari looks upward, the angle of elevation of a hot air balloon in the sky is  $\frac{\pi}{4}$  radians and from Leo the angle of elevation is  $\frac{\pi}{3}$  radians. Calculate the height of the hot air balloon from the ground, to the nearest tenth of a metre.

## 4.3 Equivalent Trigonometric Expressions

- Given that  $\cos \frac{3\pi}{7} = \sin a$ , apply a cofunction identity to determine the exact measure of angle  $a$ .
- Given that  $\tan \frac{7\pi}{9} = -\cot x$ , apply a trigonometric identity to determine the measure of angle  $x$ , to two decimal places.
- Given that  $\sin \frac{2\pi}{5} \approx 0.9511$ , determine the following, to four decimal places.
  - $\cos \frac{\pi}{10}$
  - $\cos \frac{9\pi}{10}$

## 4.4 Compound Angle Formulas

- Angle  $a$  lies in the second quadrant and angle  $b$  lies in the third quadrant such that  $\cos a = -\frac{3}{5}$  and  $\tan b = \frac{24}{7}$ . Determine an exact value for
  - $\cos(a + b)$
  - $\sin(a - b)$
  - $\sin 2a$
- A 15-m ladder leaning against a wall is in an unsafe position if it makes an angle of less than  $\frac{\pi}{12}$  radians with the wall. Use a compound angle formula to determine an exact expression for the minimum distance that the foot of the ladder can be placed from the wall so that the ladder is standing safely.

## 4.5 Prove Trigonometric Identities

- Prove that  $\frac{\tan x - \tan y}{\cot x - \cot y} = -\tan x \tan y$ .
- Consider the equation  $\cos(x - y) \cos y - \sin(x - y) \sin y = \cos x$ . Either prove that the equation is an identity, or determine a counterexample to show that it is not an identity.