

## Chapter 4 Test

### Multiple Choice

For #1 to #5, choose the best answer.

1. What is the exact value of  $\csc \frac{7\pi}{4}$ ?

A  $\frac{-\sqrt{2}}{2}$   
B  $\frac{\sqrt{2}}{2}$   
C  $-\sqrt{2}$   
D  $\sqrt{2}$

2. Determine  $\tan \theta$  if  $\sin \theta = \frac{-12}{13}$  and  $\cos \theta > 0$ .

A  $\frac{-12}{5}$   
B  $\frac{-5}{12}$   
C  $\frac{5}{12}$   
D  $\frac{12}{5}$

3. What are the coordinates of  $P\left(\frac{7\pi}{6}\right)$  if  $P(\theta)$  is the point at the intersection of the terminal arm of angle  $\theta$  and the unit circle?

A  $\left(\frac{-\sqrt{3}}{2}, \frac{-1}{2}\right)$   
B  $\left(\frac{-1}{2}, \frac{-\sqrt{3}}{2}\right)$   
C  $\left(\frac{-\sqrt{3}}{2}, \frac{1}{2}\right)$   
D  $\left(\frac{-1}{2}, \frac{\sqrt{3}}{2}\right)$

4. Suppose  $\tan^2 \theta - \tan \theta = 0$  and  $0 \leq \theta < 2\pi$ . What does  $\theta$  equal?

A  $\frac{\pi}{4}, \frac{5\pi}{4}$   
B  $\frac{3\pi}{4}, \frac{7\pi}{4}$   
C  $0, \frac{\pi}{4}, \pi, \frac{5\pi}{4}$   
D  $0, \frac{3\pi}{4}, \pi, \frac{7\pi}{4}$

5. What is the general solution of the equation  $2 \cos \theta + 1 = 0$  in degrees?

A  $240^\circ + 360^\circ n, 300^\circ + 360^\circ n, n \in \mathbb{I}$   
B  $60^\circ + 360^\circ n, 300^\circ + 360^\circ n, n \in \mathbb{I}$   
C  $60^\circ + 360^\circ n, 120^\circ + 360^\circ n, n \in \mathbb{I}$   
D  $120^\circ + 360^\circ n, 240^\circ + 360^\circ n, n \in \mathbb{I}$

### Short Answer

6. Convert to radian measure. State the method you used to arrive at your solution. Use each conversion method at least once. Give answers as both exact and approximate measures to the nearest hundredth of a unit.

a)  $270^\circ$                       b)  $-540^\circ$   
c)  $150^\circ$                       d)  $240^\circ$

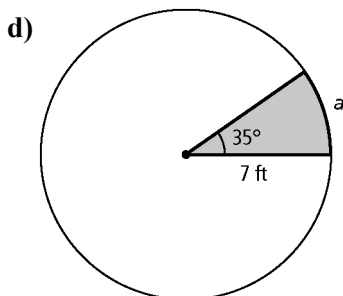
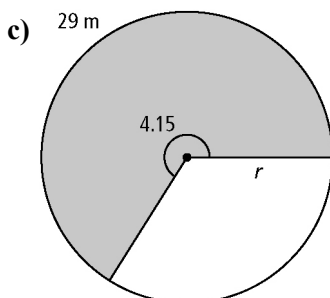
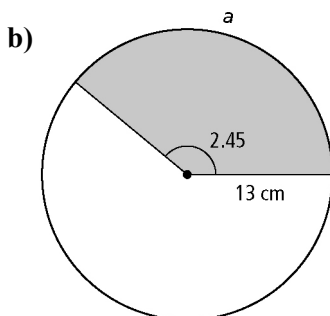
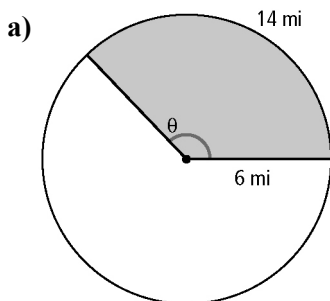
7. Convert the following radian measures to degree measure. State the method you used to arrive at your solution. Use each conversion method at least once. Give answers as approximate measures to the nearest hundredth of a unit.

a) 3.25                      b) 0.40  
c)  $-\frac{7\pi}{4}$                       d) -5.35

8. The minute hand of an analogue clock completes one revolution in 1 h. Determine the exact value of the angle, in radians, the minute hand moves in 135 min.



9. Use the information in each diagram to determine the value of the variable. Give your answers to the nearest hundredth of a unit.



10. Determine the exact value of  $\sin^2\left(-\frac{5\pi}{6}\right) - 2\cos(120^\circ)\tan\left(\frac{7\pi}{4}\right)$ .
11. Given that  $\sin \theta = 0.3$  and  $\cos \theta = 0.5$ , determine the value of  $\tan \theta$  to the nearest tenth.
12. If  $\sin \theta = \frac{\sqrt{3}}{2}$ , determine all possible coordinates of  $P(\theta)$  where the terminal arm of  $\theta$  intersects the unit circle.
13. If  $P(\theta) = \left(\frac{\sqrt{3}}{2}, \frac{-1}{2}\right)$ , what are the coordinates of  $P\left(\theta + \frac{\pi}{2}\right)$ ?

### Extended Response

14. Consider an angle of  $\frac{4\pi}{5}$  radians.
- Draw the angle in standard position.
  - Write a statement defining all angles that are coterminal with this angle.
15. The point  $(3a, -4a)$  is on the terminal arm of an angle in standard position. State the exact value of the six trigonometric ratios.
16. Solve the equation  $\sec^2 \theta - 2 = 0$ ,  $-\pi < \theta < \pi$ .
17. Consider the following trigonometric equations.
- $2 \sin \theta - \sqrt{3} = 0$
  - $\sqrt{2} \cos \theta - 1 = 0$
  - $2\sqrt{2} \sin \theta \cos \theta - 2 \sin \theta - \sqrt{6} \cos \theta + \sqrt{3} = 0$
- Solve equations A and B over the domain  $0 \leq \theta < \pi$ .
  - Explain how you can use equations A and B to solve equation C,  $0 \leq \theta < \pi$ .

