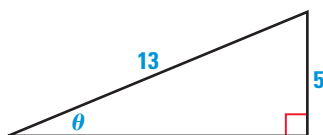# Chapter Standardized Test

▶ **TEST-TAKING STRATEGY** When taking a test, first tackle the questions that you know are easy for you to answer. Then go back and answer questions that you suspect will take you extra time and effort.

1. **MULTIPLE CHOICE** Given the diagram, which equation is correct?

Ⓐ $\sec \theta = \dfrac{12}{13}$ Ⓑ $\cot \theta = \dfrac{12}{5}$

Ⓒ $\cos \theta = \dfrac{5}{13}$ Ⓓ $\csc \theta = \dfrac{12}{5}$

Ⓔ $\sin \theta = \dfrac{13}{5}$

2. **MULTIPLE CHOICE** Suppose $(8, -15)$ is a point on the terminal side of an angle θ in standard position. Which equation is *not* true?

Ⓐ $\csc \theta = -\dfrac{15}{17}$ Ⓑ $\cos \theta = \dfrac{8}{17}$

Ⓒ $\tan \theta = -\dfrac{15}{8}$ Ⓓ $\cot \theta = -\dfrac{8}{15}$

Ⓔ $\sec \theta = \dfrac{17}{8}$

3. **MULTIPLE CHOICE** What is the value of $\cos 765°$?

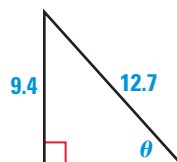Ⓐ $\dfrac{\sqrt{2}}{2}$ Ⓑ $\dfrac{2\sqrt{3}}{3}$ Ⓒ $\sqrt{2}$

Ⓓ 2 Ⓔ undefined

4. **MULTIPLE CHOICE** What is the value of $\sin\left(-\dfrac{13\pi}{6}\right)$?

Ⓐ $-\dfrac{\sqrt{3}}{2}$ Ⓑ $-\dfrac{\sqrt{2}}{2}$ Ⓒ $-\dfrac{1}{2}$

Ⓓ $\dfrac{1}{2}$ Ⓔ 1

5. **MULTIPLE CHOICE** What is the solution of the equation $\sin \theta = -\dfrac{3}{8}$, where $180° < \theta < 270°$?
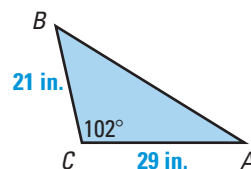
Ⓐ $-202.02°$ Ⓑ $-22.02°$ Ⓒ $22.02°$

Ⓓ $202.02°$ Ⓔ $222.02°$

6. **MULTIPLE CHOICE** What is the approximate value of θ in the triangle shown?

Ⓐ $36.5°$ Ⓑ $42.3°$ Ⓒ $47.7°$

Ⓓ $48.9°$ Ⓔ $52.6°$

7. **MULTIPLE CHOICE** What is the area of the triangle shown?

Ⓐ about 182.4 in.^{2} Ⓑ about 297.8 in.^{2}

Ⓒ about 300.8 in.^{2} Ⓓ about 304.5 in.^{2}

Ⓔ about 595.7 in.^{2}

8. **MULTIPLE CHOICE** What is the value of a in the triangle shown?
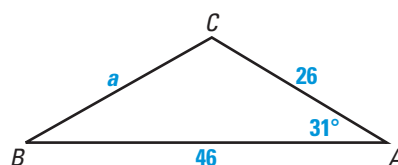
Ⓐ about 24.6 Ⓑ about 27.2

Ⓒ about 28.9 Ⓓ about 29.2

Ⓔ about 30.5

9. **MULTIPLE CHOICE** Which equation is an xy-equation for the parametric equations $x = 5t - 9$ and $y = -3t + 11$?

Ⓐ $y = \dfrac{3}{5}x + \dfrac{28}{5}$ Ⓑ $y = -\dfrac{3}{5}x + \dfrac{82}{5}$

Ⓒ $y = -\dfrac{3}{5}x - \dfrac{82}{5}$ Ⓓ $y = -\dfrac{3}{5}x - \dfrac{28}{5}$

Ⓔ $y = -\dfrac{3}{5}x + \dfrac{28}{5}$

A The quantity in column A is greater.

B The quantity in column B is greater.

C The two quantities are equal.

D The relationship cannot be determined from the given information.

|	Column A	Column B
10.	Solution of $\tan\theta = -\sqrt{3}$, where $270° \le \theta \le 360°$	Solution of $\sin\theta = -\dfrac{\sqrt{2}}{2}$, where $270° \le \theta \le 360°$
11.	Area of a sector with $r = 5$ in. and $\theta = 60°$	Area of a sector with $r = 6$ in. and $\theta = 45°$
12.	Area of a triangle with side lengths 5 cm, 8 cm, and 11 cm	Area of a triangle with side lengths 7 cm, 7 cm, and 12 cm

13. **MULTI-STEP PROBLEM** You are enjoying the view at the top of a 200 foot tall building on a clear day. To find the distance you can see to the horizon, you draw the diagram at the right.

   a. Find the value of θ in the diagram. Use 3960 miles for the value of r.

   b. Use your answer to part (a) to find the distance s you can see to the horizon.

   c. How much farther could you see to the horizon if the building were 400 feet tall?

   d. **CRITICAL THINKING** Write a general formula for finding the distance s you can see to the horizon from the top of a building that is h feet tall.

200 ft s θ r

Not drawn to scale
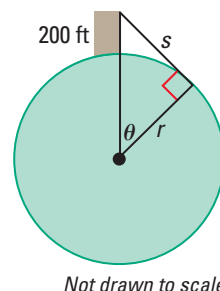
14. **MULTI-STEP PROBLEM** A trough can be made by folding a rectangular piece of metal in half and then enclosing the ends. The volume of water the trough can hold depends on how far you bend the metal.

   a. Predict the value of θ that will maximize the volume of the trough shown.

   b. Find the volume of the trough as a function of θ. (*Hint:* You will need to find the area of one of the triangular faces.)

   c. **CRITICAL THINKING** Find the value of θ that maximizes the volume. What is the maximum volume? How close was your prediction?

fold   8 ft

8 ft

θ 8 ft   4 ft
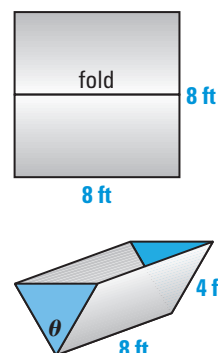
15. **MULTI-STEP PROBLEM** Two motorized toy boats are released in a pool at time $t = 0$. Boat 1 travels 65° north of east at a rate of 0.75 meter per second. Boat 2 travels due east at a rate of 0.5 meter per second.

   a. Write a set of parametric equations to describe the path of each boat.

   b. At what point will each boat hit the east edge of the pool?

   c. At what point do the paths of the two boats cross?

   d. *Writing* If the two boats are released at the same time, will they collide? If so, how many seconds after the boats are released? If not, explain why not.

boat 2   10 m   65°   boat 1   10 m   25 m