Multiple-Choice
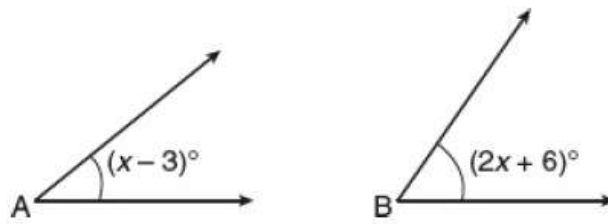

1. If in the figure above $\frac{\sin A}{\cos B} = 1$, then $x =$

   (A) 6
   (B) 26
   (C) 29
   (D) 59

2. By law, a wheelchair service ramp may be inclined no more than $4.76°$. If the base of a ramp begins 15 feet from the base of a public building, which equation could be used to determine the maximum height, h, of the ramp where it reaches the building's entrance?

   (A) $h = 15 \sin 4.76°$

   (B) $h = \dfrac{15}{\sin 4.76°}$

   (C) $h = \dfrac{\tan 4.76°}{15}$

   (D) $h = 15 \tan 4.76°$

3. What is the number of radians through which the minute hand of a clock turns in 24 minutes?

   (A) 0.2π
   (B) 0.4π
   (C) 0.6π
   (D) 0.8π

4. If $x = 1.75$ radians, then the value of $\cos x$ is closest in value to which of the following?

   (A) $-\cos 1.39$
   (B) $\cos 4.89$
   (C) $\cos 4.53$
   (D) $-\cos 0.18$

5. If $\sin \frac{2}{9}\pi = \cos x$, then $x =$

(A) $\frac{7}{9}\pi$

(B) $\frac{5}{18}\pi$

(C) $\frac{\pi}{3}$

(D) $\frac{13}{18}\pi$

6. The bottom of a pendulum traces an arc 3 feet in length when the pendulum swings through an angle of $\frac{1}{2}$ radian. What is the number of feet in the length of the pendulum?

(A) 1.5
(B) 6
(C) $\frac{1.5}{\pi}$
(D) 6π

7. What is the radian measure of the smaller angle formed by the hands of a clock at 7 o'clock?

(A) $\frac{\pi}{2}$

(B) $\frac{2\pi}{3}$

(C) $\frac{5\pi}{6}$

(D) $\frac{7\pi}{6}$

8. A wheel has a radius of 18 inches. The distance, in inches, the wheel travels when it rotates through an angle of $\frac{2}{5}\pi$ radians is closest to which value?

(A) 45
(B) 23
(C) 13
(D) 11

9. A wedge-shaped piece is cut from a circular pizza. The radius of the pizza is 14 inches and the angle of the pointed end of the pizza measures 0.35 radians. The number of inches in the length of the rounded edge of the crust is closest to which value?

(A) 4.0
(B) 4.9
(C) 5.7
(D) 7.5

I. $x = y$
II. $2(x + y) = \pi$
III. $\cos x = \sin y$

10. If $0 < x, y < \frac{\pi}{2}$, and $\sin x = \cos y$, then which of the statements above must be true?

(A) I and II only
(B) II and III only

(C) II only

(D) III only

11. If $\cos \theta = -\dfrac{3}{4}$ and $\tan \theta$ is negative, the value of $\sin \theta$ is

(A) $-\dfrac{4}{5}$

(B) $-\dfrac{\sqrt{7}}{4}$

(C) $\dfrac{4\sqrt{7}}{7}$

(D) $\dfrac{\sqrt{7}}{4}$

12. If $\cos A = \dfrac{4}{5}$ and $\angle A$ is *not* in Quadrant I, what is the value of $\sin A$?

(A) -0.6

(B) -0.2

(C) 0.6

(D) 0.75

13. If $\sin A = b$, what is the value of the product $\sin A \cdot \cos A \cdot \tan A$ in terms of b?

(A) 1

(B) $\dfrac{1}{b}$

(C) b

(D) b^2

14. The equatorial diameter of the earth is approximately 8,000 miles. A communications satellite makes a circular orbit around the earth at a distance of 1,600 miles from the earth. If the satellite completes one orbit every 5 hours, how many miles does the satellite travel in 1 hour?

(A) $1{,}120\pi$

(B) $1{,}940\pi$

(C) $2{,}240\pi$

(D) $2{,}560\pi$

15. A rod 6 inches long is pivoted at one end. If the free end of the rod rotates in a machine at the rate of 165 revolutions per minute, what is the total distance, in inches, traveled by the end of the rod in one *second*?

(A) 14.5π
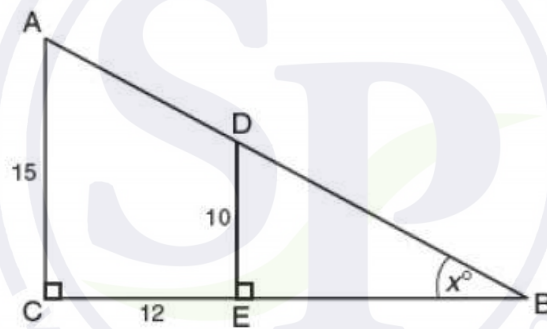
(B) 16.5π

(C) 29π

(D) 33π

Grid-In
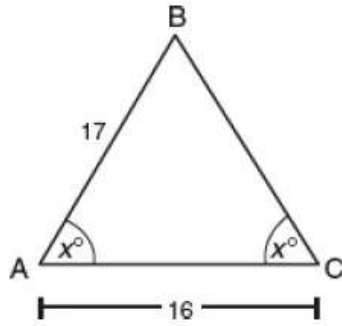
1. In the figure above, what is the value of $\sin A - \cos A$?
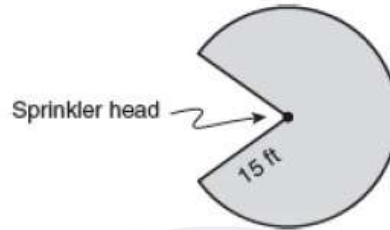
2. A lawn sprinkler sprays water in a circular pattern at a distance of 15 feet from the sprinkler head which rotates through an angle of $\frac{5\pi}{3}$ radians, as shown by the shaded area in the diagram above. What is the area of the lawn, to the *nearest square foot*, that receives water from this sprinkler?

Note: Figure not drawn to scale.

3. In the figure above, angles ACB and DEB are right angles, $AC = 15$, $CE = 12$, and $DE = 10$. What is the value of $\cos x$?

For **Questions 4 and 5** refer to the diagram.
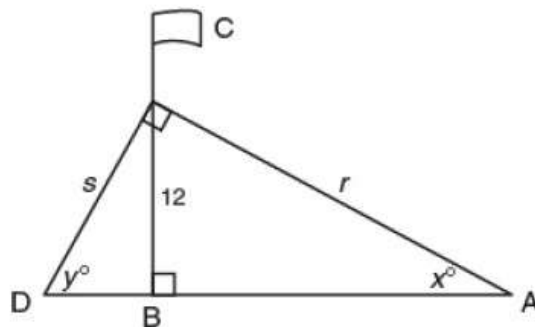
A flagpole that stands on level ground. Two cables, r and s, are attached to the pole at a point 12 feet above the ground and form a right angle with each other. Cable r is attached to the ground at a point that makes $\tan x = 0.75$.

4. What is the value of cos x?

5. What is the sum of the lengths of cables r and s?