Geometry
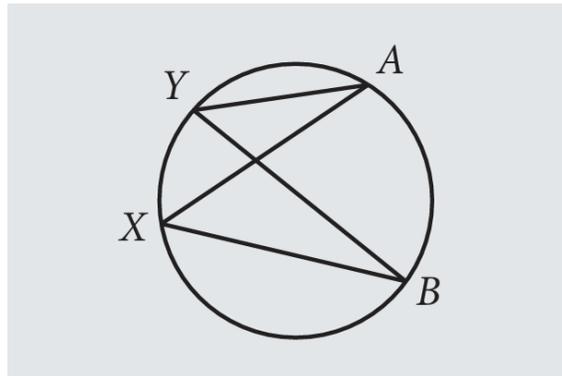

1. In the figure shown, line ℓ is parallel to line m, segment BD is perpendicular to line m, and segment AC and segment BD intersect at E. What is the length of segment AC?
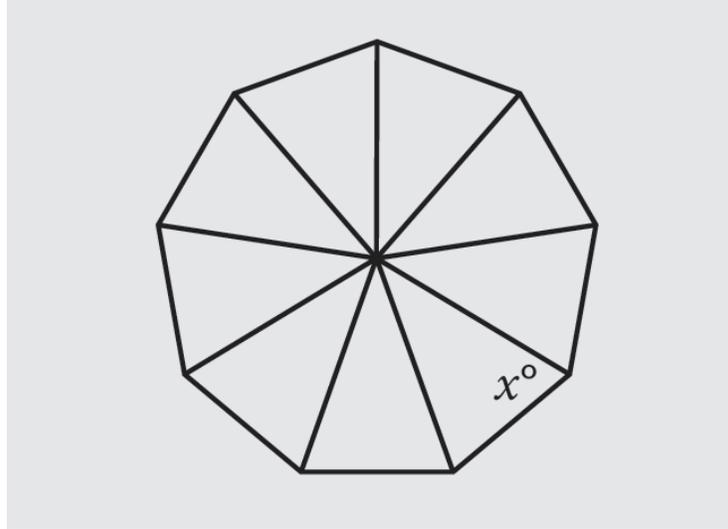
2. In the figure above, a regular polygon with 9 sides has been divided into 9 congruent isosceles triangles by line segments drawn from the center of the polygon to its vertices. What is the value of x?

3. In the figure shown, $\angle AXB$ and $\angle AYB$ are inscribed in the circle. Which of the following statements is true?

    A) The measure of $\angle AXB$ is greater than the measure of $\angle AYB$.
    B) The measure of $\angle AXB$ is less than the measure of $\angle AYB$.
    C) The measure of $\angle AXB$ is equal to the measure of $\angle AYB$.
    D) There is not enough information to determine the relationship between the measure of $\angle AXB$ and the measure of $\angle AYB$.
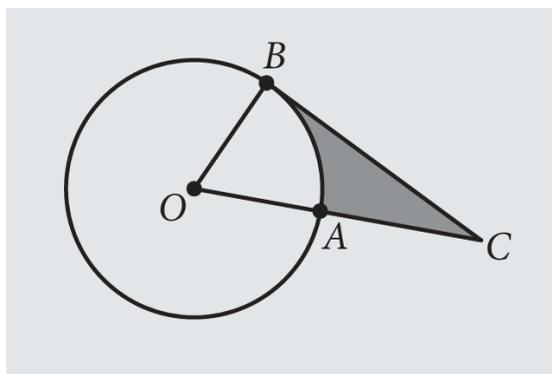
4. In the given figure, O is the center of the circle, segment BC is tangent to the circle at B, and A lies on segment OC. If the lengths of OB and AC are both 6, what is the area of the shaded region?

A) $18\sqrt{3} - 3\pi$
B) $18\sqrt{3} - 6\pi$
C) $36\sqrt{3} - 3\pi$
D) $36\sqrt{3} - 6\pi$
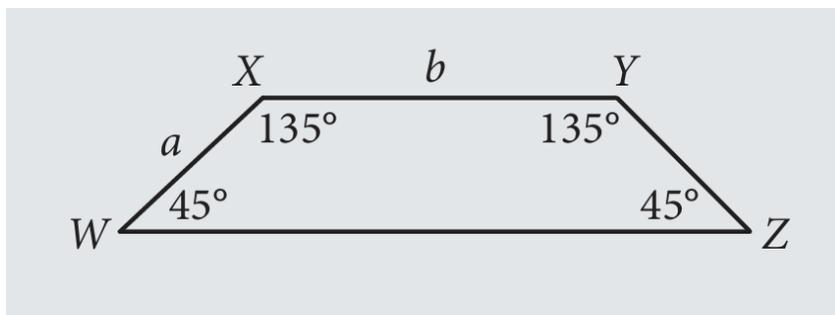
5. Trapezoid $WXYZ$ is shown. How much greater is the area of this trapezoid than the area of a parallelogram with side lengths a and b and base angles of measure $45°$ and $135°$?

A) $\frac{1}{2}a^2$

B) $\sqrt{2}\,a^2$

C) $\frac{1}{2}ab$

D) $\sqrt{2}ab$

3

6. A laboratory supply company produces graduated cylinders, each with an internal radius of 2 inches and an internal height between 7.75 inches and 8 inches. What is one possible volume, rounded to the nearest cubic inch, of a graduated cylinder produced by this company?

Coordinate Geometry

$$x^2 + (y + 1)^2 = 4$$

7. The graph of the given equation in the xy-plane is a circle. A new circle is drawn whose center is 1 unit up from this circle and whose radius is 1 more than this circle. Which of the following is an equation of this new circle?

A) $x^2 + y^2 = 5$
B) $x^2 + y^2 = 9$
C) $x^2 + (y + 2)^2 = 5$
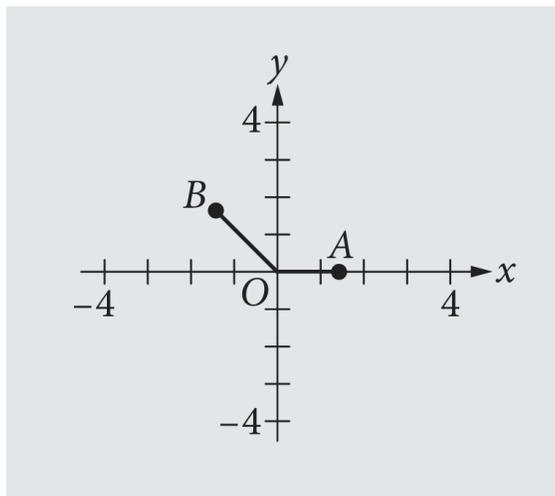D) $x^2 + (y + 2)^2 = 9$

$$x^2 + 8x + y^2 - 6y = 24$$

8. The graph of the given equation in the xy-plane is a circle. What is the radius of the circle?

Trigonometry and Radians
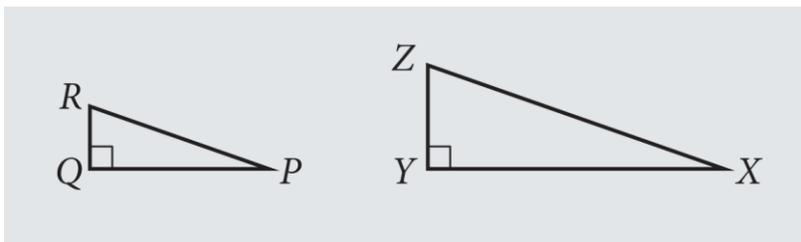
9. In the figure, right triangle PQR is similar to right triangle XYZ, with vertices P, Q, and R corresponding to vertices X, Y, and Z, respectively. If $\cos R = 0.263$, what is the value of $\cos Z$?

10. In the figure shown, the coordinates of point B are $(-\sqrt{2}, \sqrt{2})$. What is the measure, in radians, of angle AOB?

A) $\frac{\pi}{4}$

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

C) $\frac{3\pi}{4}$

D) $\frac{5\pi}{4}$

$$\sin x = \cos (K - x)$$

11. In the given equation, the angle measures are in radians and K is a constant. Which of the following could be the value of K?

A) 0

B) $\dfrac{\pi}{4}$

C) $\dfrac{\pi}{2}$

D) π

ANSWER KEY - ADVANCED MATH DRILL

1. $\dfrac{78}{5}$

2. 70

3. C

4. B

5. A

6. 97, 98, 99, 100, 101

7. B

8. 7

9. 0.263

10. C

11. C

Answer explanations can be found in the *Digital SAT Study Guide* on pages 281 to 294.