

**Math Drill**

*Time yourself from start to finish and record your time below. The SAT Non-Calculator section is all about speed and practice makes perfect!*

YOUR TIME: \_\_\_\_\_

|   |
|---|
| <b>Multiplying With Factors 2 to 13 (A)</b> |
|---|

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Score: \_\_\_\_\_ /100

Calculate each product.

$$\begin{array}{r} 8 \\ \times 10 \\ \hline \end{array} \quad \begin{array}{r} 4 \\ \times 4 \\ \hline \end{array} \quad \begin{array}{r} 13 \\ \times 6 \\ \hline \end{array} \quad \begin{array}{r} 7 \\ \times 12 \\ \hline \end{array} \quad \begin{array}{r} 8 \\ \times 11 \\ \hline \end{array} \quad \begin{array}{r} 12 \\ \times 6 \\ \hline \end{array} \quad \begin{array}{r} 5 \\ \times 13 \\ \hline \end{array} \quad \begin{array}{r} 11 \\ \times 4 \\ \hline \end{array} \quad \begin{array}{r} 9 \\ \times 13 \\ \hline \end{array} \quad \begin{array}{r} 7 \\ \times 7 \\ \hline \end{array}$$

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$$\begin{array}{r} 11 \\ \times 10 \\ \hline \end{array} \quad \begin{array}{r} 5 \\ \times 7 \\ \hline \end{array} \quad \begin{array}{r} 7 \\ \times 10 \\ \hline \end{array} \quad \begin{array}{r} 5 \\ \times 5 \\ \hline \end{array} \quad \begin{array}{r} 13 \\ \times 12 \\ \hline \end{array} \quad \begin{array}{r} 2 \\ \times 11 \\ \hline \end{array} \quad \begin{array}{r} 12 \\ \times 2 \\ \hline \end{array} \quad \begin{array}{r} 3 \\ \times 7 \\ \hline \end{array} \quad \begin{array}{r} 13 \\ \times 8 \\ \hline \end{array} \quad \begin{array}{r} 10 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 13 \\ \times 13 \\ \hline \end{array} \quad \begin{array}{r} 4 \\ \times 6 \\ \hline \end{array} \quad \begin{array}{r} 7 \\ \times 9 \\ \hline \end{array} \quad \begin{array}{r} 7 \\ \times 13 \\ \hline \end{array} \quad \begin{array}{r} 3 \\ \times 8 \\ \hline \end{array} \quad \begin{array}{r} 3 \\ \times 5 \\ \hline \end{array} \quad \begin{array}{r} 3 \\ \times 6 \\ \hline \end{array} \quad \begin{array}{r} 9 \\ \times 5 \\ \hline \end{array} \quad \begin{array}{r} 6 \\ \times 5 \\ \hline \end{array} \quad \begin{array}{r} 9 \\ \times 2 \\ \hline \end{array}$$

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$$\begin{array}{r} 4 \\ \times 7 \\ \hline \end{array} \quad \begin{array}{r} 11 \\ \times 6 \\ \hline \end{array} \quad \begin{array}{r} 4 \\ \times 3 \\ \hline \end{array} \quad \begin{array}{r} 4 \\ \times 12 \\ \hline \end{array} \quad \begin{array}{r} 5 \\ \times 12 \\ \hline \end{array} \quad \begin{array}{r} 10 \\ \times 5 \\ \hline \end{array} \quad \begin{array}{r} 9 \\ \times 4 \\ \hline \end{array} \quad \begin{array}{r} 10 \\ \times 12 \\ \hline \end{array} \quad \begin{array}{r} 12 \\ \times 5 \\ \hline \end{array} \quad \begin{array}{r} 2 \\ \times 11 \\ \hline \end{array}$$

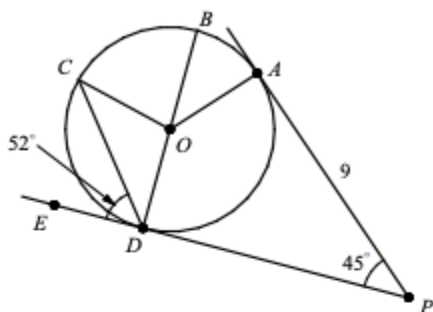
$$\begin{array}{r} 9 \\ \times 10 \\ \hline \end{array} \quad \begin{array}{r} 8 \\ \times 13 \\ \hline \end{array} \quad \begin{array}{r} 9 \\ \times 8 \\ \hline \end{array} \quad \begin{array}{r} 5 \\ \times 3 \\ \hline \end{array} \quad \begin{array}{r} 7 \\ \times 2 \\ \hline \end{array} \quad \begin{array}{r} 7 \\ \times 11 \\ \hline \end{array} \quad \begin{array}{r} 7 \\ \times 12 \\ \hline \end{array} \quad \begin{array}{r} 10 \\ \times 6 \\ \hline \end{array} \quad \begin{array}{r} 4 \\ \times 7 \\ \hline \end{array} \quad \begin{array}{r} 2 \\ \times 10 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ \times 3 \\ \hline \end{array} \quad \begin{array}{r} 12 \\ \times 6 \\ \hline \end{array} \quad \begin{array}{r} 3 \\ \times 10 \\ \hline \end{array} \quad \begin{array}{r} 6 \\ \times 7 \\ \hline \end{array} \quad \begin{array}{r} 4 \\ \times 6 \\ \hline \end{array} \quad \begin{array}{r} 11 \\ \times 10 \\ \hline \end{array} \quad \begin{array}{r} 11 \\ \times 5 \\ \hline \end{array} \quad \begin{array}{r} 11 \\ \times 3 \\ \hline \end{array} \quad \begin{array}{r} 13 \\ \times 13 \\ \hline \end{array} \quad \begin{array}{r} 13 \\ \times 10 \\ \hline \end{array}$$

## Unit 19 - Circles

Topic: Arcs, Angles, and Tangents

Questions 1 - 4 refer to the following information.



In the figure above,  $\overline{BD}$  is a diameter, and  $\overline{PA}$  and  $\overline{PD}$  are tangents to circle  $O$ .  $m\angle CDE = 52$ ,  $m\angle APD = 45$ , and  $AP = 9$ .

1

What is the measure of  $\angle ODC$ ?

2

What is the measure of  $\angle OCD$ ?

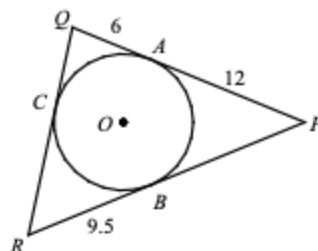
3

What is the measure of  $\angle AOD$ ?

4

What is the length of  $PD$ ?

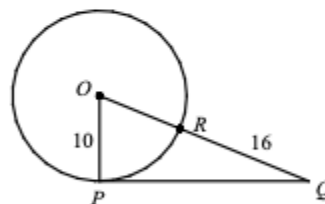
5



In the figure above,  $\odot O$  is inscribed in  $\triangle PQR$ . If  $PA = 12$ ,  $QA = 6$ , and  $RB = 9.5$ , what is the perimeter of  $\triangle PQR$ ?

- A) 46
- B) 49
- C) 52
- D) 55

6

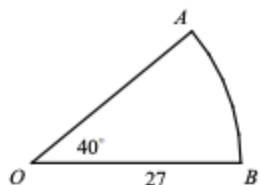


In the figure above,  $\overline{OP}$  is a radius and  $\overline{PQ}$  is tangent to circle  $O$ . If the radius of circle  $O$  is 10 and  $QR = 16$ , what is the length of  $\overline{PQ}$ ?

- A) 16
- B) 20
- C) 24
- D) 28

## Topic: Arc Lengths and Areas of Sectors

Questions 1 and 2 refer to the following information.



In the figure above,  $\widehat{AB}$  is an arc of a circle with radius 27 cm.

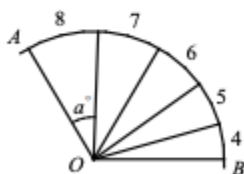
1

If the length of arc  $\widehat{AB}$  is  $k\pi$ , what is the value of  $k$ ?

2

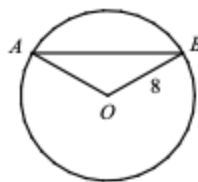
If the area of sector  $OAB$  is  $n\pi$ , what is the value of  $n$ ?

3



The figure above shows arcs of length 8, 7, 6, 5, and 4. If  $m\widehat{AB} = 120$ , what is the degree measure of angle  $a$ ?

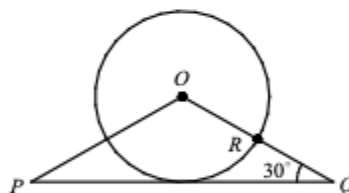
4



In the figure above, the radius of the circle is 8 and  $m\angle AOB = 120^\circ$ . What is the length of  $\widehat{AB}$ ?

- A)  $8\sqrt{2}$
- B)  $8\sqrt{3}$
- C)  $12\sqrt{2}$
- D)  $12\sqrt{3}$

5

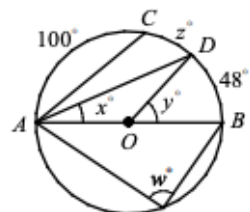


In the figure above,  $OP = OQ$  and  $\overline{PQ}$  is tangent to circle  $O$ . If the radius of circle  $O$  is 8, what is the length of  $\overline{QR}$ ?

- A)  $10(\sqrt{2} - 1)$
- B) 6
- C)  $10(\sqrt{3} - 1)$
- D) 8

## Topic: Inscribed Angles

Questions 1 - 4 refer to the following information.



In circle  $O$  above,  $\overline{AB}$  is a diameter.

1

What is the value of  $y$ ?

2

What is the value of  $x$ ?

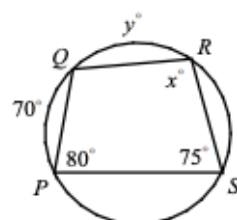
3

What is the value of  $w$ ?

4

What is the value of  $z$ ?

Questions 5 and 6 refer to the following information.



In the figure above, a quadrilateral is inscribed in a circle.

5

What is the value of  $x$ ?

A) 70

B) 80

C) 90

D) 100

6

What is the value of  $y$ ?

A) 75

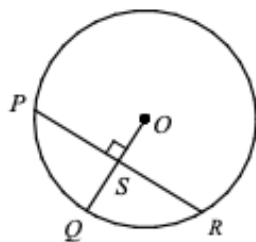
B) 80

C) 85

D) 90

## Topic: Arcs and Chords

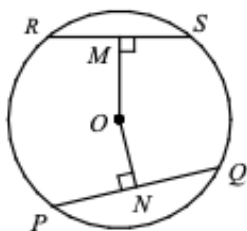
1



In circle  $O$  above, if the radius is 13 and  $PR = 24$ , what is the length of  $QS$ ?

- A) 6
- B) 7
- C) 8
- D) 9

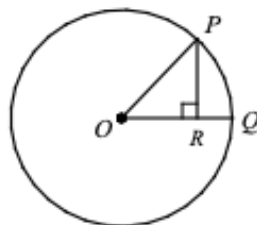
2



In the circle above, if  $RS = 6$ ,  $OM = 5$ , and  $ON = 4$ , what is the length of  $PQ$ ?

- A)  $4\sqrt{2}$
- B) 6
- C)  $6\sqrt{2}$
- D)  $6\sqrt{3}$

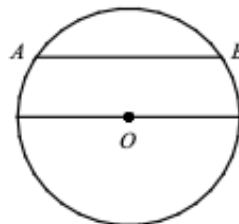
3



In circle  $O$  above, the area of the circle is  $9\pi$  and  $PR = \sqrt{5}$ . What is the length of  $QR$ ?

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

4

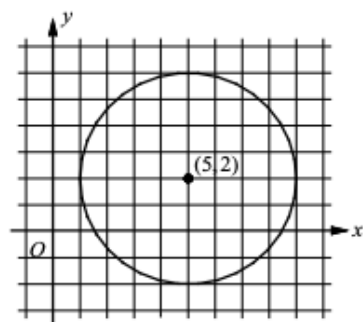


In the figure above, the radius of the circle is 12. If the length of chord  $\overline{AB}$  is 18, what is the distance between the chord and the diameter?

- A)  $2\sqrt{10}$
- B)  $3\sqrt{7}$
- C)  $4\sqrt{5}$
- D)  $6\sqrt{2}$

## Topic: Circles in the Coordinate Plane

1



Which of the following equations represents the equation of the circle shown in the  $xy$ -plane above?

- A)  $(x+5)^2 + (y+2)^2 = 4$
- B)  $(x-5)^2 + (y-2)^2 = 4$
- C)  $(x+5)^2 + (y+2)^2 = 16$
- D)  $(x-5)^2 + (y-2)^2 = 16$

2

Which of the following is an equation of a circle in the  $xy$ -plane with center  $(-2, 0)$  and a radius with endpoint  $(0, \frac{3}{2})$ ?

- A)  $x^2 + (y - \frac{3}{2})^2 = \frac{5}{2}$
- B)  $x^2 + (y - \frac{3}{2})^2 = \frac{25}{4}$
- C)  $(x+2)^2 + y^2 = \frac{25}{4}$
- D)  $(x-2)^2 + y^2 = \frac{25}{4}$

3

$$x^2 + 12x + y^2 - 4y + 15 = 0$$

The equation of a circle in the  $xy$ -plane is shown above. Which of the following is true about the circle?

- A) center  $(-6, 2)$ , radius  $= 5$
- B) center  $(6, -2)$ , radius  $= 5$
- C) center  $(-6, 2)$ , radius  $= \sqrt{15}$
- D) center  $(6, -2)$ , radius  $= \sqrt{15}$

4

Which of the following represents an equation of a circle whose diameter has endpoints  $(-8, 4)$  and  $(2, -6)$ ?

- A)  $(x-3)^2 + (y-1)^2 = 50$
- B)  $(x+3)^2 + (y+1)^2 = 50$
- C)  $(x-3)^2 + (y-1)^2 = 25$
- D)  $(x+3)^2 + (y+1)^2 = 25$

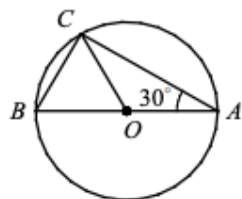
5

$$x^2 + 2x + y^2 - 4y - 9 = 0$$

The equation of a circle in the  $xy$ -plane is shown above. If the area of the circle is  $k\pi$ , what is the value of  $k$ ?

## Unit 19 Review Questions

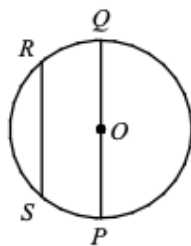
1



In the figure above,  $O$  is the center of the circle and  $\overline{AB}$  is a diameter. If the length of  $\overline{AC}$  is  $4\sqrt{3}$  and  $m\angle BAC = 30^\circ$ , what is the area of circle  $O$ ?

- A)  $12\pi$
- B)  $16\pi$
- C)  $18\pi$
- D)  $24\pi$

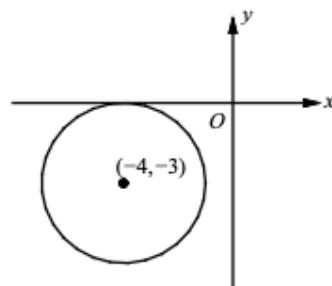
2



In the circle above, chord  $\overline{RS}$  is parallel to diameter  $\overline{PQ}$ . If the length of  $\overline{RS}$  is  $\frac{3}{4}$  of the length of  $\overline{PQ}$  and the distance between the chord and the diameter is  $2\sqrt{7}$ , what is the radius of the circle?

- A) 6
- B)  $3\sqrt{7}$
- C) 8
- D)  $4\sqrt{7}$

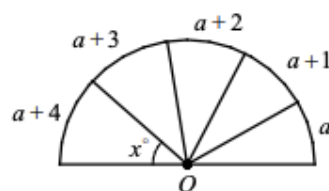
3



In the figure above, the circle is tangent to the  $x$ -axis and has center  $(-4, -3)$ . Which of the following equations represents the equation of the circle shown in the  $xy$ -plane above?

- A)  $(x+4)^2 + (y+3)^2 = 9$
- B)  $(x-4)^2 + (y-3)^2 = 9$
- C)  $(x+4)^2 + (y+3)^2 = 3$
- D)  $(x-4)^2 + (y-3)^2 = 3$

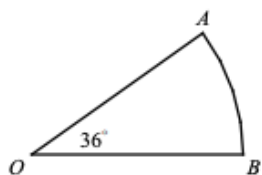
4



The figure above shows a semicircle with the lengths of the adjacent arcs  $a$ ,  $a+1$ ,  $a+2$ ,  $a+3$ , and  $a+4$ . If the value of  $x$  is 42, what is the value of  $a$ ?

- A) 7
- B) 8
- C) 9
- D) 10

5



In the figure above, the length of arc  $\widehat{AB}$  is  $\pi$ . What is the area of sector  $OAB$ ?

- A)  $2\pi$
- B)  $\frac{5}{2}\pi$
- C)  $3\pi$
- D)  $\frac{7}{2}\pi$

6

$$x^2 - 4x + y^2 - 6y - 17 = 0$$

What is the area of the circle in the  $xy$ -plane above?

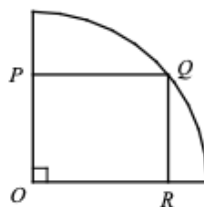
- A)  $20\pi$
- B)  $24\pi$
- C)  $26\pi$
- D)  $30\pi$

7

Which of the following is the equation of a circle that has a diameter of 8 units and is tangent to the graph of  $y = 2$ ?

- A)  $(x+1)^2 + (y+2)^2 = 16$
- B)  $(x-1)^2 + (y-2)^2 = 16$
- C)  $(x+2)^2 + (y+1)^2 = 16$
- D)  $(x-2)^2 + (y-1)^2 = 16$

8



In the figure above, rectangle  $OPQR$  is inscribed in a quarter circle that has a radius of 9. If  $PQ = 7$ , what is the area of rectangle  $OPQR$ ?

- A)  $24\sqrt{2}$
- B)  $26\sqrt{2}$
- C)  $28\sqrt{2}$
- D)  $30\sqrt{2}$

9

In a circle with center  $O$ , the central angle has a measure of  $\frac{2\pi}{3}$  radians. The area of the sector formed by central angle  $AOB$  is what fraction of the area of the circle?

10

A wheel with a radius of 2.2 feet is turning at a constant rate of 400 revolutions per minute on a road. If the wheel traveled  $k\pi$  miles in one hour what is the value of  $k$ ? (1 mile = 5,280 feet)