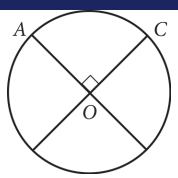
Question ID 23c5fcce

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Geometry and Trigonometry	Circles	■□□

ID: 23c5fcce



The circle above with center O has a circumference of 36.
What is the length of minor arc $\overset{\frown}{AC}$?

A. 9

B. 12

C. 18

D. 36

ID: 23c5fcce Answer

Correct Answer: A

Rationale

Choice A is correct. A circle has 360 degrees of arc. In the circle shown, O is the center of the circle and $\angle AOC$ is a central angle of the circle. From the figure, the two diameters that meet to form $\angle AOC$ are perpendicular, so the measure of $\angle AOC$ is $90°$. Therefore, the length of minor arc $\overset{\frown}{AC}$ is $\frac{90}{360}$ of the circumference of the circle. Since the circumference of the circle is 36, the length of minor arc $\overset{\frown}{AC}$ is $\frac{90}{360} \times 36 = 9$.

Choices B, C, and D are incorrect. The perpendicular diameters divide the circumference of the circle into four equal arcs; therefore, minor arc $\overset{\frown}{AC}$ is $\frac{1}{4}$ of the circumference. However, the lengths in choices B and C are, respectively, $\frac{1}{3}$ and $\frac{1}{2}$ the circumference of the circle, and the length in choice D is the length of the entire circumference. None of these lengths is $\frac{1}{4}$ the circumference.

Question Difficulty: Easy

Question ID 8e7689e0

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Geometry and Trigonometry	Circles	■■□

ID: 8e7689e0

The number of radians in a 720-degree angle can be written as $a\pi$, where *a* is a constant. What is the value of *a* ?

ID: 8e7689e0 Answer

Rationale

The correct answer is 4. There are π radians in a 180° angle. An angle measure of 720° is 4 times greater than an angle measure of 180°. Therefore, the number of radians in a 720° angle is 4π.

Question Difficulty: Medium

Question ID 74d8b897

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Geometry and Trigonometry	Circles	■■□

ID: 74d8b897

An angle has a measure of $\frac{9\pi}{20}$ radians. What is the measure of the angle in degrees?

ID: 74d8b897 Answer

Correct Answer: 81

Rationale

The correct answer is 81. The measure of an angle, in degrees, can be found by multiplying its measure, in radians, by $\frac{180 \text{ degrees}}{\pi \text{ radians}}$. Multiplying the given angle measure, $\frac{9\pi}{20}$ radians, by $\frac{180 \text{ degrees}}{\pi \text{ radians}}$ yields $\frac{9\pi}{20} \text{ radians} \frac{180 \text{ degrees}}{\pi \text{ radians}}$, which is equivalent to 81 degrees.

Question Difficulty: Medium

Question ID 856372ca

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Geometry and Trigonometry	Circles	■■□

ID: 856372ca

In the *xy*-plane, a circle with radius 5 has center $(-8,6)$. Which of the following is an equation of the circle?

A. $(x-8)^2+(y+6)^2=25$

B. $(x+8)^2+(y-6)^2=25$

C. $(x-8)^2+(y+6)^2=5$

D. $(x+8)^2+(y-6)^2=5$

ID: 856372ca Answer

Correct Answer: B

Rationale

Choice B is correct. An equation of a circle is $(x-h)^2+(y-k)^2=r^2$, where the center of the circle is (h,k) and the radius is r. It's given that the center of this circle is $(-8,6)$ and the radius is 5. Substituting these values into the equation gives $(x-(-8))^2+(y-6)^2=5^2$, or $(x+8)^2+(y-6)^2=25$.

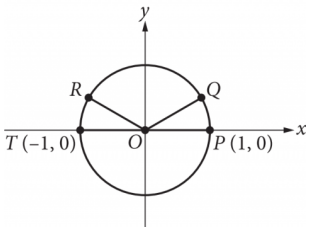
Choice A is incorrect. This is an equation of a circle that has center $(8,-6)$. Choice C is incorrect. This is an equation of a circle that has center $(8,-6)$ and radius $\sqrt{5}$. Choice D is incorrect. This is an equation of a circle that has radius $\sqrt{5}$.

Question Difficulty: Medium

Question ID 95ba2d09

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Geometry and Trigonometry	Circles	■■□

ID: 95ba2d09



In the *xy*-plane above, points *P*, *Q*, *R*, and *T* lie on the circle with center *O*. The degree measures of angles POQ and ROT are each 30°. What is the radian measure of angle QOR ?

A. $\frac{5}{6}\pi$

B. $\frac{3}{4}\pi$

C. $\frac{2}{3}\pi$

D. $\frac{1}{3}\pi$

ID: 95ba2d09 Answer

Correct Answer: C

Rationale

Choice C is correct. Because points T, O, and P all lie on the x-axis, they form a line. Since the angles on a line add up to $180°$, and it's given that angles POQ and ROT each measure $30°$, it follows that the measure of angle *QOR* is $180° - 30° - 30° = 120°$. Since the arc of a complete circle is $360°$ or 2π radians, a proportion can be set up to convert the measure of angle QOR from degrees to radians: $\frac{360 \text{ degrees}}{2\pi \text{ radians}} = \frac{120 \text{ degrees}}{x \text{ radians}}$, where x is the radian measure of angle QOR. Multiplying each side of the proportion by $2\pi x$ gives $360x = 240\pi$. Solving for x gives $\frac{240}{360}\pi$, or $\frac{2}{3}\pi$.

Choice A is incorrect and may result from subtracting only angle POQ from $180°$ to get a value of $150°$ and then finding the radian measure equivalent to that value. Choice B is incorrect and may result from a calculation error. Choice D is incorrect and may result from calculating the sum of the angle measures, in radians, of angles POQ and ROT.

Question Difficulty: Medium

Question ID 82c8325f

Assessment	Test	Domain	Skill	Difficulty
SAT	Math	Geometry and Trigonometry	Circles	■■□

ID: 82c8325f

A circle in the *xy*-plane has its center at $(-4, 5)$ and the point $(-8, 8)$ lies on the circle. Which equation represents this circle?

A. msup $+ (y + 5)^2 = 5$

B. msup $+ (y - 5)^2 = 5$

C. msup $+ (y + 5)^2 = 25$

D. msup $+ (y - 5)^2 = 25$

ID: 82c8325f Answer

Correct Answer: D

Rationale

Choice D is correct. A circle in the *xy*-plane can be represented by an equation of the form $x - h^2 + y - k^2 = r^2$, where h, k is the center of the circle and r is the length of a radius of the circle. It's given that the circle has its center at $-4, 5$. Therefore, $h = -4$ and $k = 5$. Substituting -4 for h and 5 for k in the equation $x - h^2 + y - k^2 = r^2$ yields $x - -4^2 + y - 5^2 = r^2$, or $x + 4^2 + y - 5^2 = r^2$. It's also given that the point $-8, 8$ lies on the circle. Substituting -8 for x and 8 for y in the equation $x + 4^2 + y - 5^2 = r^2$ yields $-8 + 4^2 + 8 - 5^2 = r^2$, or $-4^2 + 3^2 = r^2$, which is equivalent to $16 + 9 = r^2$, or $25 = r^2$. Substituting 25 for r^2 in the equation $x + 4^2 + y - 5^2 = r^2$ yields $x + 4^2 + y - 5^2 = 25$. Thus, the equation $x + 4^2 + y - 5^2 = 25$ represents the circle.

Choice A is incorrect. The circle represented by this equation has its center at $4, -5$, not $-4, 5$, and the point $-8, 8$ doesn't lie on the circle.

Choice B is incorrect. The point $-8, 8$ doesn't lie on the circle represented by this equation.

Choice C is incorrect. The circle represented by this equation has its center at $4, -5$, not $-4, 5$, and the point $-8, 8$ doesn't lie on the circle.

Question Difficulty: Medium