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 <u>degrees</u>?

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 $\left(\frac{9\pi}{20} \text{ radians}\right)\left(\frac{180 \text{ degrees}}{\pi \text{ radians}}\right)$, 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

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

ID: 95ba2d09
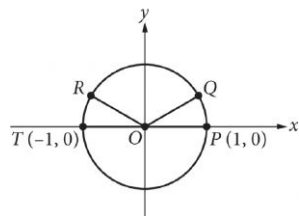
In the *xy*-plane above, points *P*, *Q*, *R*, and *T* lie on the circle with center *O*. The degree measures of angles POQ and ROT are each 30°. What is the <u>radian</u> measure of angle QOR ?

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

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

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

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

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: $\dfrac{360\text{ degrees}}{2\pi\text{ radians}} = \dfrac{120\text{ degrees}}{x\text{ radians}}$, 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 $\dfrac{240}{360}\pi$, or $\dfrac{2}{3}\pi$.

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

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

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. $(x-4)^2 + (y+5)^2 = 5$

B. $(x+4)^2 + (y-5)^2 = 5$

C. $(x-4)^2 + (y+5)^2 = 25$

D. $(x+4)^2 + (y-5)^2 = 25$

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