3.2B Sine, Cosine, and Tangent

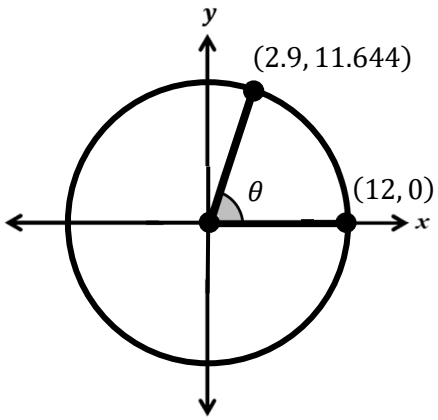
AP Precalculus

Solutions

3.2B Practice

Each figure below gives a circle in the xy-plane with center at the origin, and an angle θ in standard position. Find the value of each expression.

1.

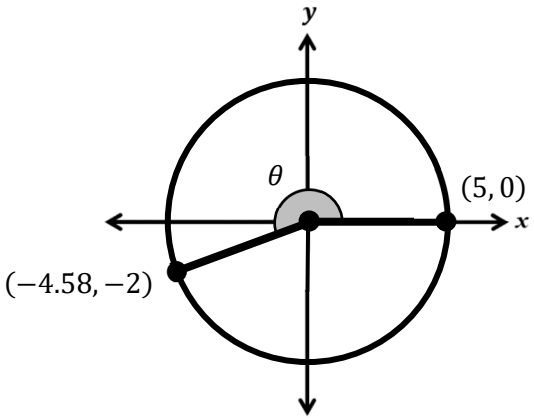


a. $\sin\theta = \frac{11.644}{12} \approx \mathbf{0.970}$

b. $\cos\theta = \frac{2.9}{12} \approx \mathbf{0.2416}$

c. $\tan\theta = \frac{11.644}{2.9} \approx \mathbf{4.015}$

2.

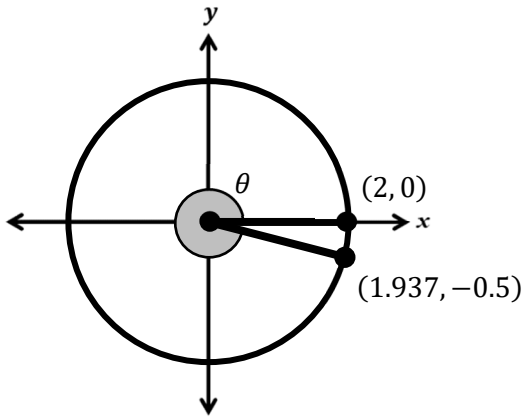


a. $\sin\theta = \frac{-2}{5} = \mathbf{-0.4}$

b. $\cos\theta = \frac{-4.58}{5} = \mathbf{-0.916}$

c. $\tan\theta = \frac{-2}{-4.58} \approx \mathbf{0.4366}$

3.

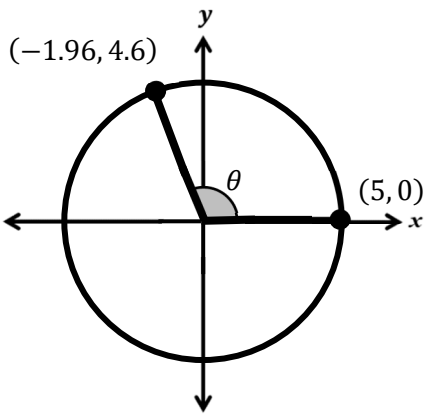


a. $\sin\theta = \frac{-0.5}{2} = \mathbf{-0.25}$

b. $\cos\theta = \frac{1.937}{2} = \mathbf{0.9685}$

c. $\tan\theta = \frac{-0.5}{1.937} \approx \mathbf{-0.258}$

4.

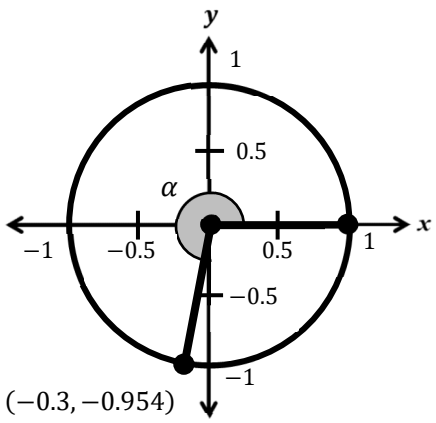


a. $\sin\theta = \frac{4.6}{5} = \mathbf{0.92}$

b. $\cos\theta = \frac{-1.96}{5} = \mathbf{-0.392}$

c. $\tan\theta = \frac{4.6}{-1.96} \approx \mathbf{-2.3469}$

5.

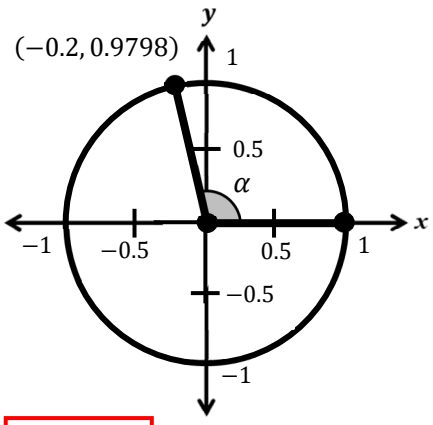


a. $\sin\alpha = \mathbf{-0.954}$

b. $\cos\alpha = \mathbf{-0.3}$

c. $\tan\alpha = \frac{-0.954}{-0.3} = \mathbf{3.18}$

6.



a. $\sin\alpha = \mathbf{0.9798}$

b. $\cos\alpha = \mathbf{-0.2}$

c. $\tan\alpha = \frac{0.9798}{-0.2} \approx \mathbf{-4.899}$

3.2B Sine, Cosine, and Tangent

3.2B Test Prep

7. In the xy-plane, angle ABC is an angle in standard position with terminal ray BC, which intersects the unit circle at the point with coordinates $(0.6, -0.8)$. Which of the following descriptions is correct?

(A) The sine of angle ABC is $-\frac{4}{3}$.

(B) The sine of angle ABC is $-\frac{3}{4}$.

(C) The sine of angle ABC is 0.6.

(D) The sine of angle ABC is -0.8.

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8. An angle θ is in standard position in the xy-plane. On the interval $0 \le \theta \le 2\pi$ (one full circle), in which quadrant(s) would the terminal ray of the angle be located for each statement?

a. $\sin\theta < 0$

Quadrants III and IV

b. $\cos\theta > 0$

Quadrants I and IV

c. $\tan\theta > 0$

Quadrants I and III

9. An angle θ is in standard position in the xy-plane. Which of the following is true about θ on the interval $0 \leq \theta \leq 2\pi$ if $\cos\theta < 0$?

D

(A) There is no value of θ on $0 \leq \theta \leq 2\pi$ for which $\cos\theta < 0$.

(B) There are values of θ on $0 \leq \theta \leq 2\pi$ for which $\cos\theta < 0$ in all four Quadrants.

(C) There is a value of θ on $0 \leq \theta \leq 2\pi$ for which $\cos\theta < 0$ in Quadrant II only.

(D) There are values of θ on $0 \leq \theta \leq 2\pi$ for which $\cos\theta < 0$ in Quadrants II and III only.

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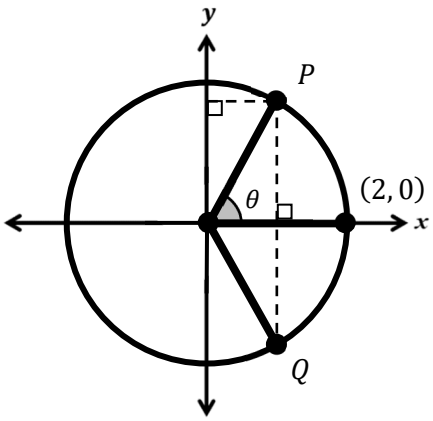
10. The figure shows a circle centered at the origin with an angle of measure θ radians in standard position. The terminal ray of the angle intersects the circle at point P, and point Q also lies on the circle. The coordinates of P are (x, y) and the coordinates of Q are $(x, -y)$. Which of the following is true about the cosine of θ?



A

(A) $\cos\theta = \frac{x}{2}$, because it is the ratio of the horizontal displacement of P from the y-axis to the distance between the origin and P.

(B) $\cos\theta = \frac{-y}{2}$, because it is the ratio of the vertical displacement of Q from the x-axis to the distance between the origin and Q.

(C) $\cos\theta = \frac{y}{2}$, because it is the ratio of the vertical displacement of P from the x-axis to the distance between the origin and P.

(D) $\cos\theta = \frac{y}{2}$, because it is the ratio of the vertical displacement of Q from the x-axis to the distance between the origin and Q.