MCQ_Review_Unit_3

1. A complex number is represented by a point in the complex plane. The complex number has the rectangular coordinates $(3,3)$. Which of the following is one way to express the complex number using its polar coordinates (r, θ) ?

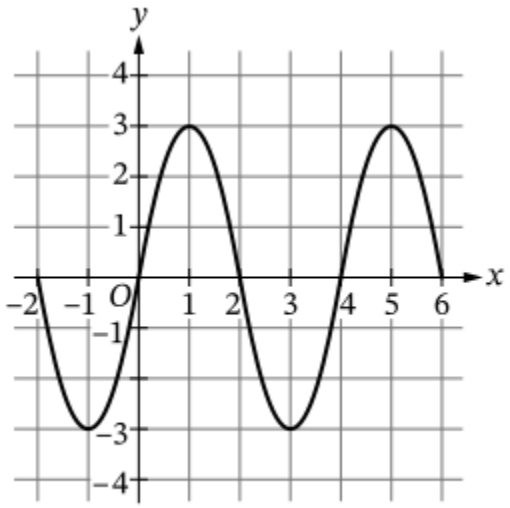
(A) $\left(3\sqrt{2}\cos\left(\frac{\pi}{4}\right)\right) + i\left(3\sqrt{2}\sin\left(\frac{\pi}{4}\right)\right)$

(B) $\left(3\cos\left(\frac{\pi}{4}\right)\right) + i\left(3\sin\left(\frac{\pi}{4}\right)\right)$

(C) $\left(3\sqrt{2}\cos\left(-\frac{\pi}{4}\right)\right) + i\left(3\sqrt{2}\sin\left(-\frac{\pi}{4}\right)\right)$

(D) $\left(3\cos\left(-\frac{\pi}{4}\right)\right) + i\left(3\sin\left(-\frac{\pi}{4}\right)\right)$

2.



Graph of f

Let f be a sinusoidal function. The graph of $y = f(x)$ is given in the xy-plane. What is the period of f ?

(A) 2

(B) 3

(C) 4

(D) 6

3. The function f is given by $f(x) = \frac{1}{2}\sin x$ for $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$. What are the domain and range of the inverse function of f ?

(A) Domain: $\left[-\frac{1}{2}, \frac{1}{2}\right]$, Range: $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

(B) Domain: $[-1,1]$, Range: $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

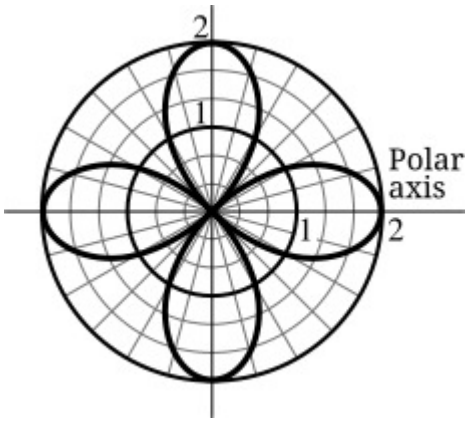
(C) Domain: $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$, Range: $\left[-\frac{1}{2}, \frac{1}{2}\right]$

(D) Domain: $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$, Range: $[-1,1]$

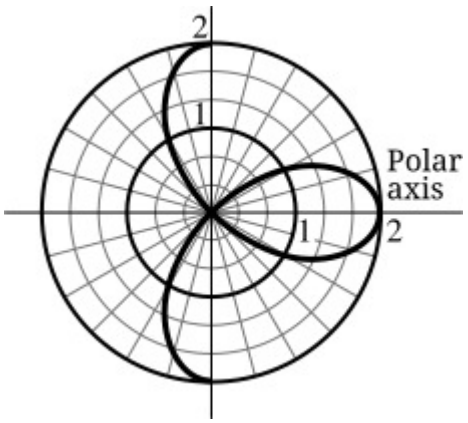
4. Which of the following is the graph of the polar function $r = f(\theta)$, where $f(\theta) = 2\cos(2\theta)$, in the polar coordinate system for $-\frac{\pi}{2} \leq \theta \leq \frac{\pi}{2}$?

MCQ_Review_Unit_3

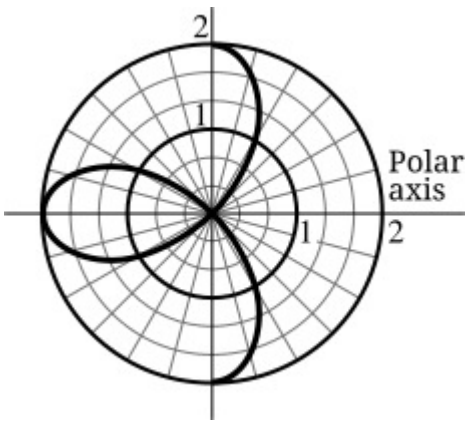
(A)



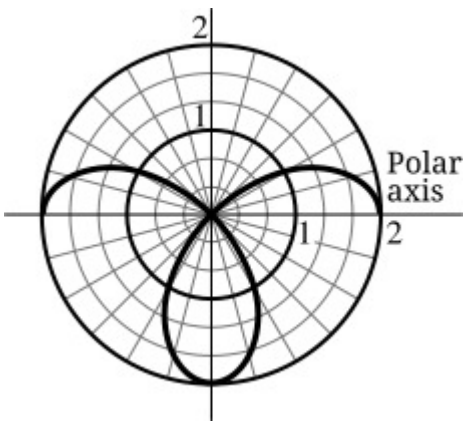
(B)



(C)



(D)



MCQ_Review_Unit_3

5. In the xy-plane, an angle in standard position measures $\frac{5\pi}{6}$ radians. A circle centered at the origin has radius 4. What are the coordinates of the point of intersection of the terminal ray of the angle and the circle?

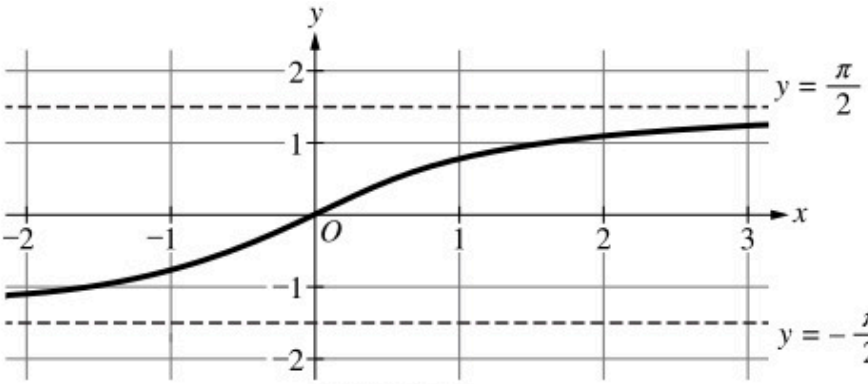
(A) $\left(-2\sqrt{3}, 2\right)$

(B) $\left(-\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$

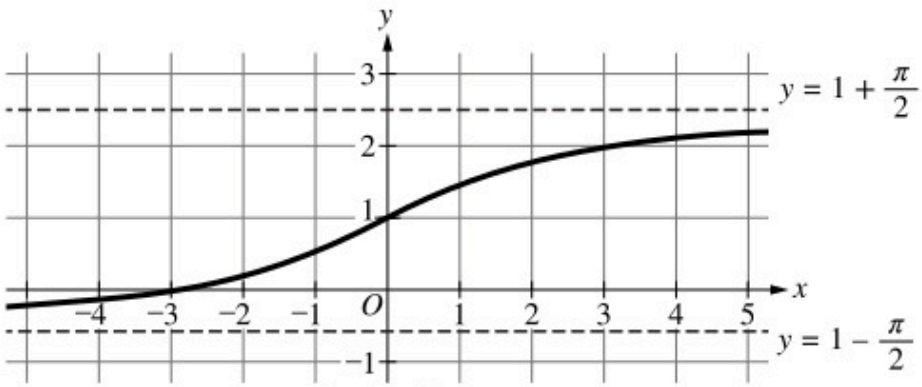
(C) $\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$

(D) $\left(2\sqrt{3}, 2\right)$

6.



Graph of f



Graph of g

The figure gives the graphs of the functions f and g in the xy-plane. The function f is given by $f(x) = \tan^{-1} x$. Which of the following defines $g(x)$?

(A) $\tan^{-1} x + 1$

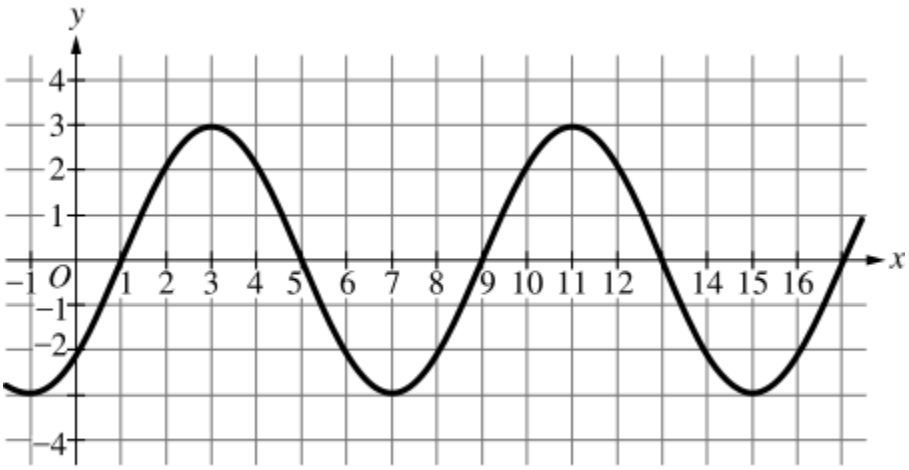
(B) $\tan^{-1} x + \frac{\pi}{2}$

(C) $\tan^{-1}\left(\frac{x}{2}\right) + 1$

(D) $\tan^{-1}\left(\frac{x}{2}\right) + \frac{\pi}{2}$

MCQ_Review_Unit_3

7.



Graph of g

The figure shows the graph of a sinusoidal function g. What are the values of the period and amplitude of g ?

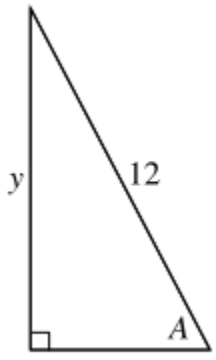
(A) The period is 4, and the amplitude is 3.

(B) The period is 8, and the amplitude is 3.

(C) The period is 4, and the amplitude is 6.

(D) The period is 8, and the amplitude is 6.

8.



The figure gives a right triangle, where y is the length of the side opposite angle A. If the function f gives values of A as a function of y, which of the following could define $f(y)$?

(A) $f(y) = \cos\left(\frac{y}{12}\right)$

(B) $f(y) = \sin\left(\frac{y}{12}\right)$

(C) $f(y) = \cos^{-1}\left(\frac{y}{12}\right)$

(D) $f(y) = \sin^{-1}\left(\frac{y}{12}\right)$

MCQ_Review_Unit_3

9. Consider the graph of the polar function $r = f(\theta)$, where $f(\theta) = 4\sin(2\theta)$, in the polar coordinate system. On the interval $0 \le \theta \le 2\pi$, which of the following is true about the graph of $r = f(\theta)$?

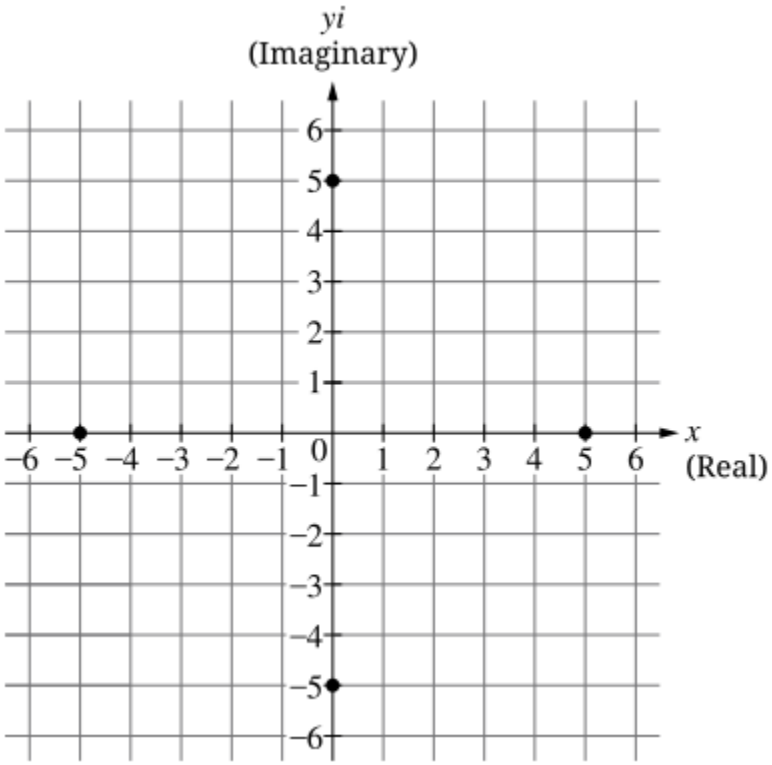
(A) For the input values $\theta = \frac{\pi}{4}$, $\theta = \frac{3\pi}{4}$, $\theta = \frac{5\pi}{4}$, and $\theta = \frac{7\pi}{4}$, the function $r = f(\theta)$ has extrema that correspond to points that are farthest from the origin.

(B) For the input values $\theta = \frac{\pi}{4}$, $\theta = \frac{3\pi}{4}$, $\theta = \frac{5\pi}{4}$, and $\theta = \frac{7\pi}{4}$, the function $r = f(\theta)$ has extrema. However, only the points corresponding to $\theta = \frac{\pi}{4}$ and $\theta = \frac{5\pi}{4}$ are farthest from the origin.

(C) For the input values $\theta = \frac{\pi}{2}$ and $\theta = \frac{3\pi}{2}$, the function $r = f(\theta)$ has extrema that correspond to points that are farthest from the origin.

(D) For the input values $\theta = \frac{\pi}{2}$ and $\theta = \frac{3\pi}{2}$, the function $r = f(\theta)$ has extrema. However, only the point corresponding to $\theta = \frac{\pi}{2}$ is farthest from the origin.

10.



The graph indicates four points in the complex plane. Each complex number has polar coordinates (r, θ). Which of the following completes the expression for the four points in the polar form $(5\cos\theta) + i(5\sin\theta)$?

(A) $\theta = \frac{\pi}{4} + \left(\frac{\pi}{4}\right)k$, where $k = 1,\ 2,\ 3,\ 4$

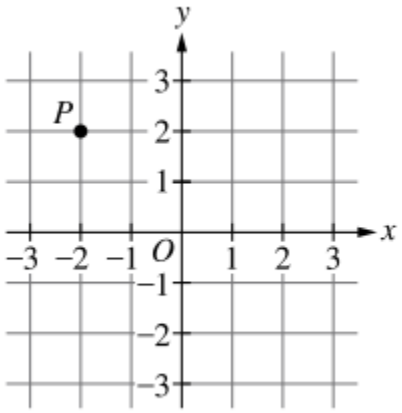
(B) $\theta = \frac{\pi}{4} + \left(\frac{\pi}{2}\right)k$, where $k = 1,\ 2,\ 3,\ 4$

(C) $\theta = \frac{\pi}{2} + \left(\frac{\pi}{2}\right)k$, where $k = 1,\ 2,\ 3,\ 4$

(D) $\theta = \frac{\pi}{2} + \pi k$, where $k = 1,\ 2,\ 3,\ 4$

MCQ_Review_Unit_3

11.



The graph of point P is given in the xy-plane. Which of the following are possible polar coordinates of point P ?

(A) $\left(2, \frac{\pi}{4}\right)$

(B) $\left(2, \frac{3\pi}{4}\right)$

(C) $\left(2\sqrt{2}, \frac{\pi}{4}\right)$

(D) $\left(2\sqrt{2}, \frac{3\pi}{4}\right)$

12. The function g is given by $g(\theta) = \cos(2\theta)$. The sinusoidal function h is a phase shift of the function g by $-\frac{\pi}{3}$ units. Which of the following is true?

(A) Consecutive minima of h occur at $\left(-\frac{5\pi}{6}, h\left(-\frac{5\pi}{6}\right)\right)$ and $\left(\frac{\pi}{6}, h\left(\frac{\pi}{6}\right)\right)$ because consecutive minima of g occur at $\left(-\frac{\pi}{2}, g\left(-\frac{\pi}{2}\right)\right)$ and $\left(\frac{\pi}{2}, g\left(\frac{\pi}{2}\right)\right)$, and h is the image of g with a horizontal shift of $\frac{\pi}{3}$ units left.

(B) Consecutive minima of h occur at $\left(-\frac{\pi}{6}, h\left(-\frac{\pi}{6}\right)\right)$ and $\left(\frac{5\pi}{6}, h\left(\frac{5\pi}{6}\right)\right)$ because consecutive minima of g occur at $\left(-\frac{\pi}{2}, g\left(-\frac{\pi}{2}\right)\right)$ and $\left(\frac{\pi}{2}, g\left(\frac{\pi}{2}\right)\right)$, and h is the image of g with a horizontal shift of $\frac{\pi}{3}$ units right.

(C) Consecutive minima of h occur at $\left(-\frac{4\pi}{3}, h\left(-\frac{4\pi}{3}\right)\right)$ and $\left(\frac{2\pi}{3}, h\left(\frac{2\pi}{3}\right)\right)$ because consecutive minima of g occur at $(-\pi, g(-\pi))$ and $(\pi, g(\pi))$, and h is the image of g with a horizontal shift of $\frac{\pi}{3}$ units left.

(D) Consecutive minima of h occur at $\left(-\frac{2\pi}{3}, h\left(-\frac{2\pi}{3}\right)\right)$ and $\left(\frac{4\pi}{3}, h\left(\frac{4\pi}{3}\right)\right)$ because consecutive minima of g occur at $(-\pi, g(-\pi))$ and $(\pi, g(\pi))$, and h is the image of g with a horizontal shift of $\frac{\pi}{3}$ units right.

13. In the polar coordinate system, the point A has polar coordinates $\left(5, \frac{\pi}{4}\right)$. Which of the following also gives the location of point A in polar coordinates?

(A) $\left(-5, \frac{3\pi}{4}\right)$

(B) $\left(-5, \frac{5\pi}{4}\right)$

(C) $\left(-5, \frac{7\pi}{4}\right)$

(D) $\left(-5, \frac{9\pi}{4}\right)$

MCQ_Review_Unit_3

14.

x	0	1	2	3	4
y	5	4	3	4	5

The table gives ordered pairs for five points from a larger data set. The larger data set can be modeled by a sinusoidal function f with a period of 4. The maximum values of the data set occur at x-values that are multiples of 4. Which of the following best defines $f(x)$ for the larger data set?

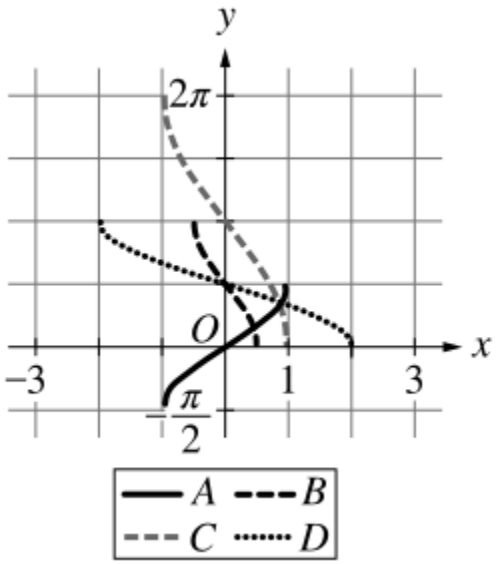
(A) $\cos\left(\frac{\pi}{2}x\right)+4$

(B) $\cos(\pi x)+4$

(C) $2\cos\left(\frac{\pi}{2}x\right)+4$

(D) $2\cos(\pi x)+4$

15.



The figure gives the graphs of four functions labeled A, B, C, and D in the xy-plane. Which is the graph of $f(x)=2\cos^{-1}x$?

(A) A

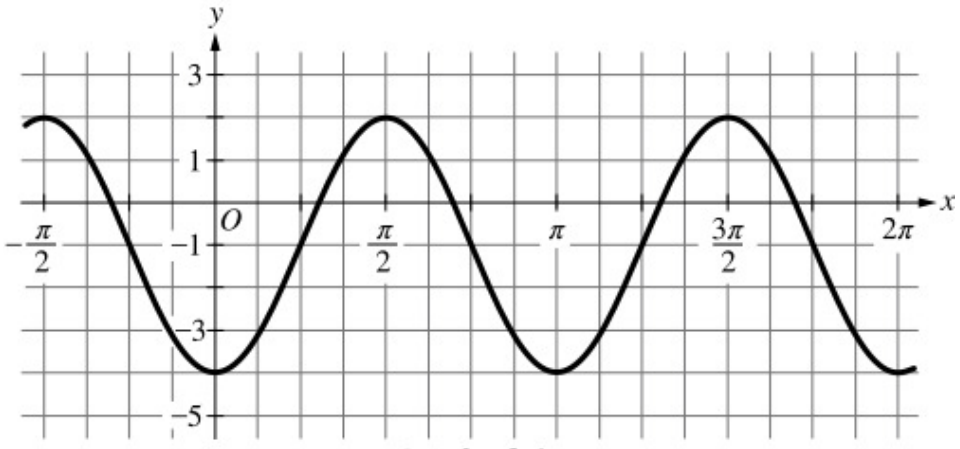
(B) B

(C) C

(D) D

MCQ_Review_Unit_3

16.



Graph of f

The figure shows the graph of a trigonometric function f. Which of the following could be an expression for $f(x)$?

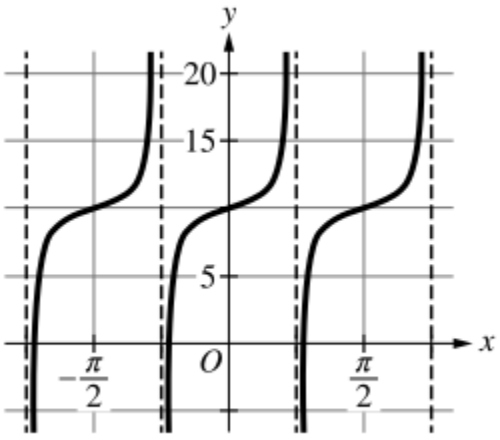
(A) $3\cos\left(2\left(x-\frac{\pi}{4}\right)\right)-1$

(B) $3\cos\left(2\left(x-\frac{\pi}{8}\right)\right)-1$

(C) $3\sin\left(2\left(x-\frac{\pi}{4}\right)\right)-1$

(D) $3\sin\left(2\left(x-\frac{\pi}{8}\right)\right)-1$

17.



Graph of h

The graph of the function h is given in the xy-plane. If $h(x)=a\tan(bx)+10$, where a and b are constants, which of the following is true?

(A) $a>0$ and $b>1$

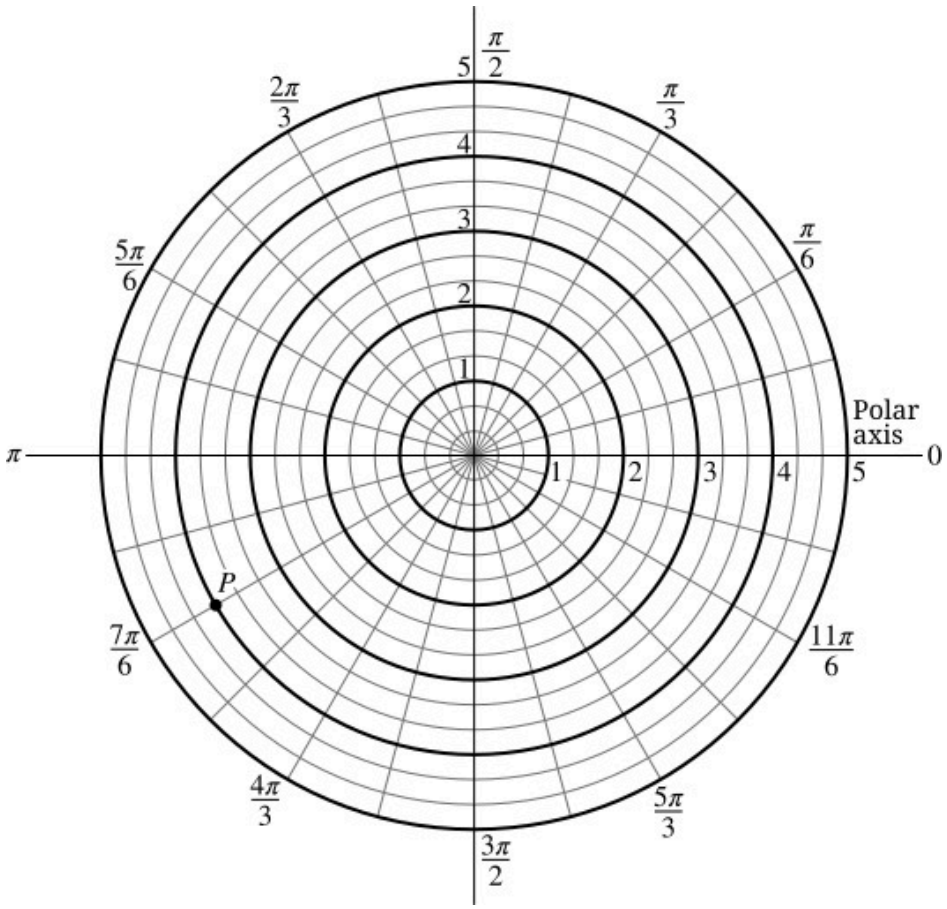
(B) $a>0$ and $0<b<1$

(C) $a<0$ and $b>1$

(D) $a<0$ and $0<b<1$

MCQ_Review_Unit_3

18.



The figure shows the polar coordinate system with point P labeled. Point P is rotated an angle of measure $\frac{\pi}{2}$ clockwise about the origin. The image of this transformation is at the location K (not shown). What are the rectangular coordinates of K ?

(A) $\left(-2,2\sqrt{3}\right)$

(B) $\left(-2\sqrt{3},2\right)$

(C) $\left(2,-2\sqrt{3}\right)$

(D) $\left(2\sqrt{3},-2\right)$

19. Which of the following expresses the complex number $10+10i$ using polar coordinates in the form $(r\cos\theta)+i(r\sin\theta)$?

(A) $\left(\frac{1}{10}\cos\left(\frac{\pi}{4}\right)\right)+i\left(\frac{1}{10}\sin\left(\frac{\pi}{4}\right)\right)$

(B) $(10\cos 0)+i\left(10\sin\left(\frac{\pi}{2}\right)\right)$

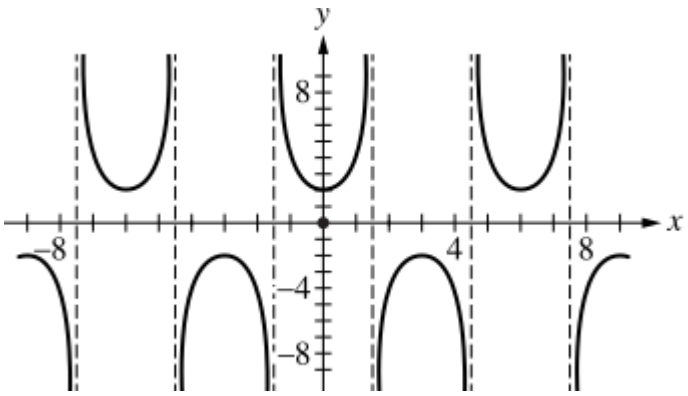
(C) $\left(10\cos\left(\frac{\pi}{4}\right)\right)+i\left(10\sin\left(\frac{\pi}{4}\right)\right)$

(D) $\left(10\sqrt{2}\cos\left(\frac{\pi}{4}\right)\right)+i\left(10\sqrt{2}\sin\left(\frac{\pi}{4}\right)\right)$

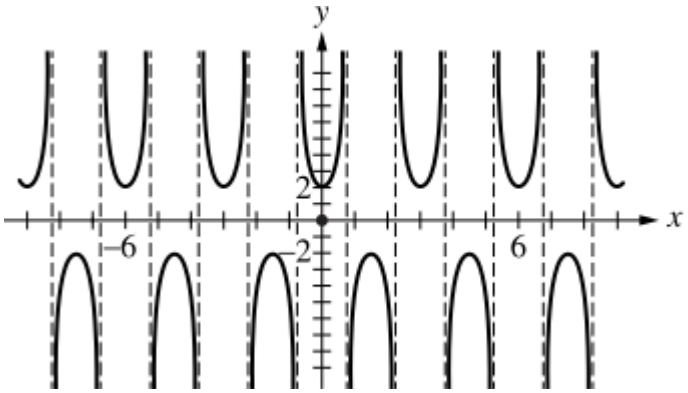
MCQ_Review_Unit_3

20. Which of the following is the graph of $f(x) = 2\csc\left(\frac{2\pi}{3}x\right)$ in the xy-plane?

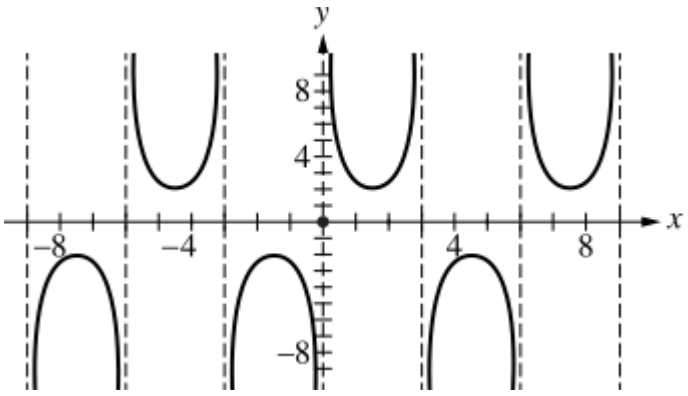
(A)



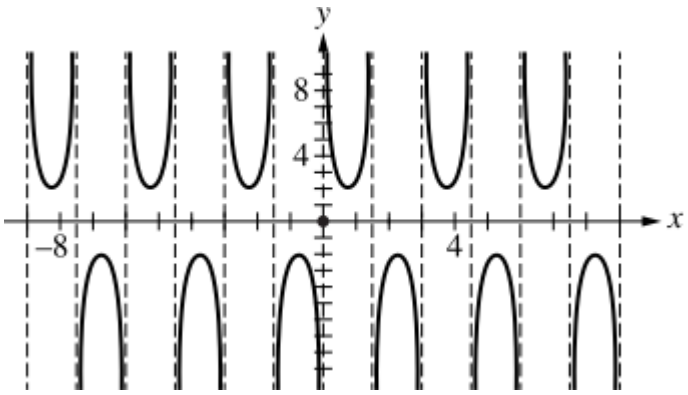
(B)



(C)



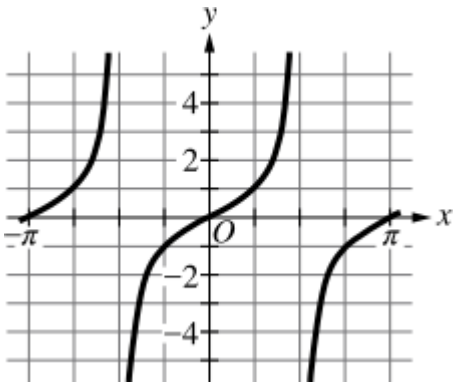
(D)



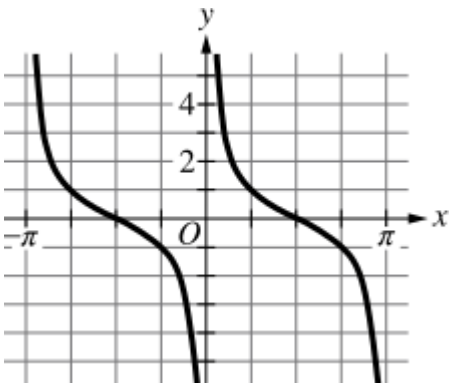
MCQ_Review_Unit_3

21. Which of the following is the graph of $f(x) = \cot x$ in the xy-plane?

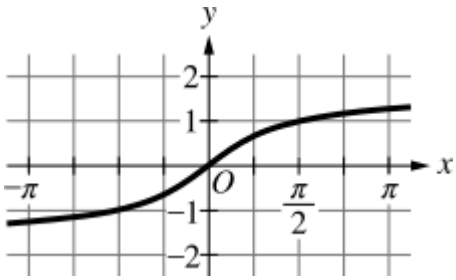
(A)



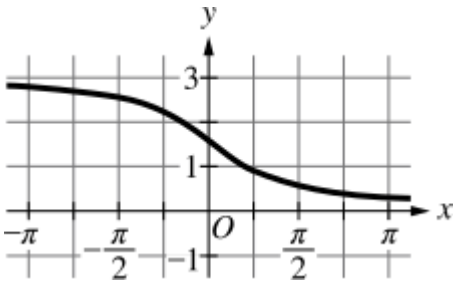
(B)



(C)



(D)



22. The function f is given by $f(t) = \sin^2 t - 1$. For how many values of t does $f(t) = 0$?

(A) None

(B) One

(C) Two

(D) Infinitely many

MCQ_Review_Unit_3

23. In the xy-plane, the terminal ray of angle θ in standard position intersects a circle of radius r at the point $\left(10, -10\sqrt{3}\right)$. What are the values of θ and r ?

(A) $\theta = \frac{5\pi}{3}$ and $r = 10$

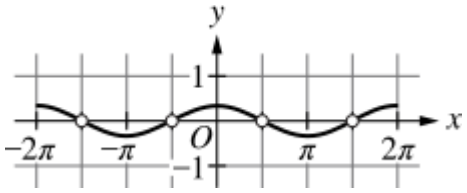
(B) $\theta = \frac{5\pi}{3}$ and $r = 20$

(C) $\theta = \frac{11\pi}{6}$ and $r = 10$

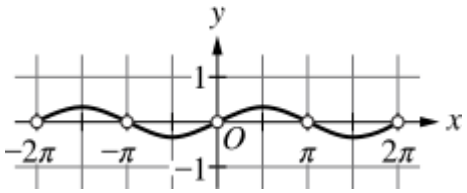
(D) $\theta = \frac{11\pi}{6}$ and $r = 20$

24. The function f is defined by $f(x) = 3\sec x$. The function g is defined by $g(x) = \frac{1}{f(x)}$. Which of the following is the graph of g in the xy-plane?

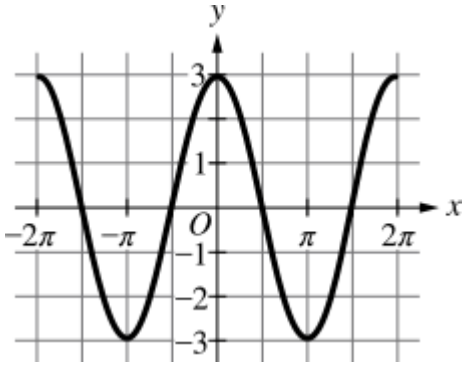
(A)



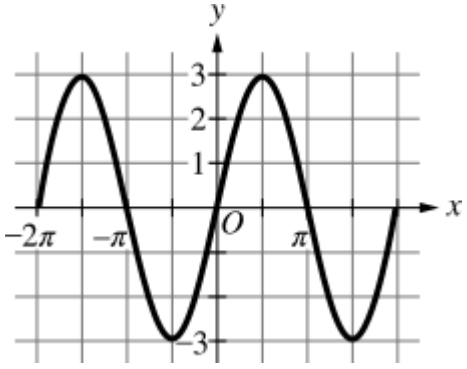
(B)



(C)



(D)



MCQ_Review_Unit_3

25. The function g is given by $g(x) = 3\csc(\pi(x+2)) - 1$. Which of the following describes the range of g ?

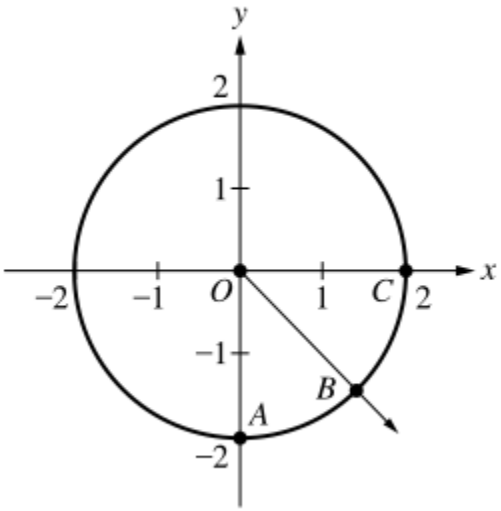
(A) The range of g is $[-3,3]$.

(B) The range of g is $(-\infty, -2] \cup [4, \infty)$.

(C) The range of g is $(-\infty, -3] \cup [3, \infty)$.

(D) The range of g is $(-\infty, -4] \cup [2, \infty)$.

26.



The figure shows a circle of radius 2 along with four labeled points in the xy-plane. The measure of angle COB is equal to the measure of angle AOB. What are the coordinates of point B ?

(A) $\left(\cos\left(\frac{7\pi}{4}\right), \sin\left(\frac{7\pi}{4}\right)\right)$

(B) $\left(\sin\left(\frac{7\pi}{4}\right), \cos\left(\frac{7\pi}{4}\right)\right)$

(C) $\left(2\cos\left(\frac{7\pi}{4}\right), 2\sin\left(\frac{7\pi}{4}\right)\right)$

(D) $\left(2\sin\left(\frac{7\pi}{4}\right), 2\cos\left(\frac{7\pi}{4}\right)\right)$

27. Which of the following describes the graph of $f(x) = \cot x$?

(A) The graph has vertical asymptotes at $x = \frac{\pi}{2} + \pi k$, where k is any integer, and the function is increasing on all intervals in its domain.

(B) The graph has vertical asymptotes at $x = \frac{\pi}{2} + \pi k$, where k is any integer, and the function is decreasing on all intervals in its domain.

(C) The graph has vertical asymptotes at $x = \pi + \pi k$, where k is any integer, and the function is increasing on all intervals in its domain.

(D) The graph has vertical asymptotes at $x = \pi + \pi k$, where k is any integer, and the function is decreasing on all intervals in its domain.

MCQ_Review_Unit_3

28. Angles A and B are in standard position in the xy-plane. The measure of angle A is $\frac{2\pi}{3}$ radians, and the measure of angle B is $\frac{4\pi}{3}$ radians. The terminal rays of both angles intersect a circle centered at the origin with radius 20. What is the distance between these two points of intersection: the circle and terminal ray of angle A, and the circle and terminal ray of angle B ?

(A) $\cos\left(\frac{2\pi}{3}\right) - \cos\left(\frac{4\pi}{3}\right)$

(B) $20\cos\left(\frac{2\pi}{3}\right) - 20\cos\left(\frac{4\pi}{3}\right)$

(C) $\sin\left(\frac{2\pi}{3}\right) - \sin\left(\frac{4\pi}{3}\right)$

(D) $20\sin\left(\frac{2\pi}{3}\right) - 20\sin\left(\frac{4\pi}{3}\right)$

29. The function f is defined by $f(x) = \sec\left(\frac{1}{2}\left(x - \frac{\pi}{2}\right)\right)$. Which of the following describes the domain of f ?

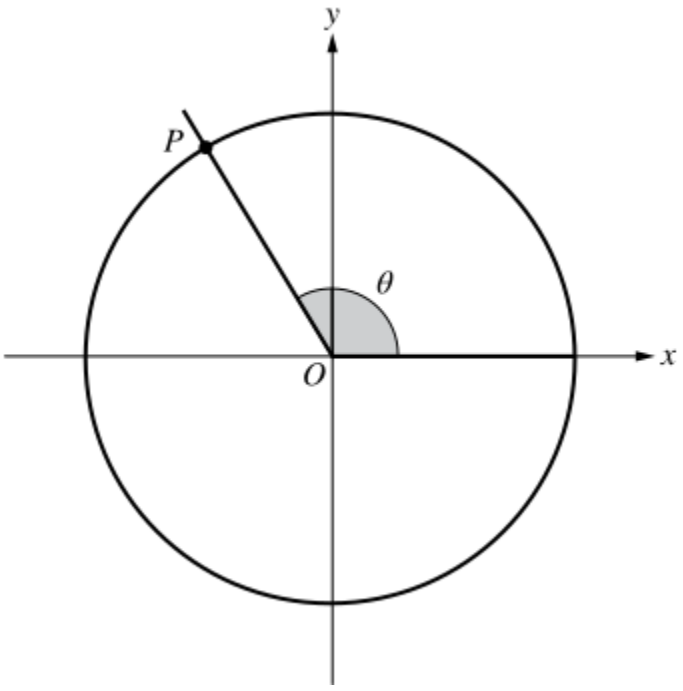
(A) The domain is the set of all real numbers x, except when $x = \frac{\pi}{2} + \pi k$, where k is any integer.

(B) The domain is the set of all real numbers x, except when $x = \frac{\pi}{2} + 2\pi k$, where k is any integer.

(C) The domain is the set of all real numbers x, except when $x = \pi + 2\pi k$, where k is any integer.

(D) The domain is the set of all real numbers x, except when $x = \frac{3\pi}{2} + 2\pi k$, where k is any integer.

30.

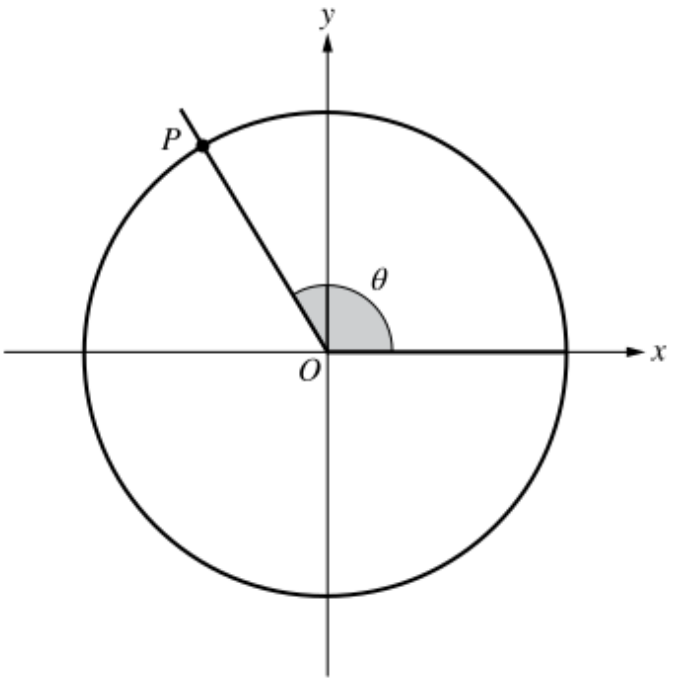


The figure shows the terminal ray of angle θ, in standard position, intersecting the unit circle at point P in the xy -plane. The function g is given by $g(z) = \cos z$. For the angle ω (not shown), $\theta < \omega < \pi$. Which of the following is true?

MCQ_Review_Unit_3

(A) $g(\omega) < g(\theta)$
(B) $g(\omega) > g(\theta)$
(C) $g(\omega) = g(\theta)$
(D) Depending on the value of ω, sometimes $g(\omega) < g(\theta)$ and sometimes $g(\omega) > g(\theta)$.

31.



The figure shows the terminal ray of angle θ, in standard position, intersecting the unit circle at point P in the xy -plane. The function f is given by $f(z) = \sin z$. For the angle β (not shown), $\frac{\pi}{2} < \beta < \theta$. Which of the following is true?

(A) $f(\beta) < f(\theta)$
(B) $f(\beta) > f(\theta)$
(C) $f(\beta) = f(\theta)$
(D) Depending on the value of β, sometimes $f(\beta) < f(\theta)$ and sometimes $f(\beta) > f(\theta)$.

32. The function g is given by $g(\theta) = \cos\theta$. Which of the following describes g on the interval from $\theta = \frac{3\pi}{2}$ to $\theta = 2\pi$?

MCQ_Review_Unit_3

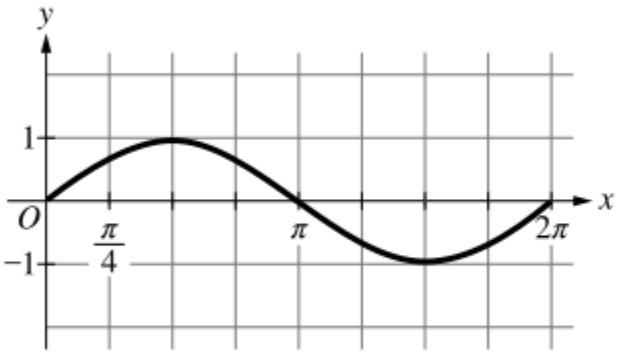
(A) g is decreasing, and the graph of g is concave down.

(B) g is decreasing, and the graph of g is concave up.

(C) g is increasing, and the graph of g is concave down.

(D) g is increasing, and the graph of g is concave up.

33.



Graph of f

The figure shows the graph of the function f in the xy-plane. The function f is either a sine function or a cosine function. Consider an angle in standard position in another xy-plane (not shown). The terminal ray of the angle intersects the unit circle at point P. Which of the following is true about the relationship between f and P ?

(A) f gives the vertical distance of P from the x-axis for angle measures from 0 to 2π.

(B) f gives the horizontal distance of P from the y-axis for angle measures from 0 to 2π.

(C) f gives the vertical displacement of P from the x-axis for angle measures from 0 to 2π.

(D) f gives the horizontal displacement of P from the y-axis for angle measures from 0 to 2π.

34. The function f is given by $f(\theta) = \cos\theta$, and the function g is given by $g(\theta) = \sin\theta$. Which of the following describes f and g on the interval from $\theta = \frac{\pi}{2}$ to $\theta = \pi$?

(A) Both f and g are decreasing.

(B) Both f and g are increasing.

(C) f is decreasing, and g is increasing.

(D) f is increasing, and g is decreasing.

35. The function f is given by $f(\theta) = \sin\theta$. Which of the following describes f on the interval from $\theta = \pi$ to $\theta = \frac{3\pi}{2}$?

(A) f is decreasing, and the graph of f is concave down.

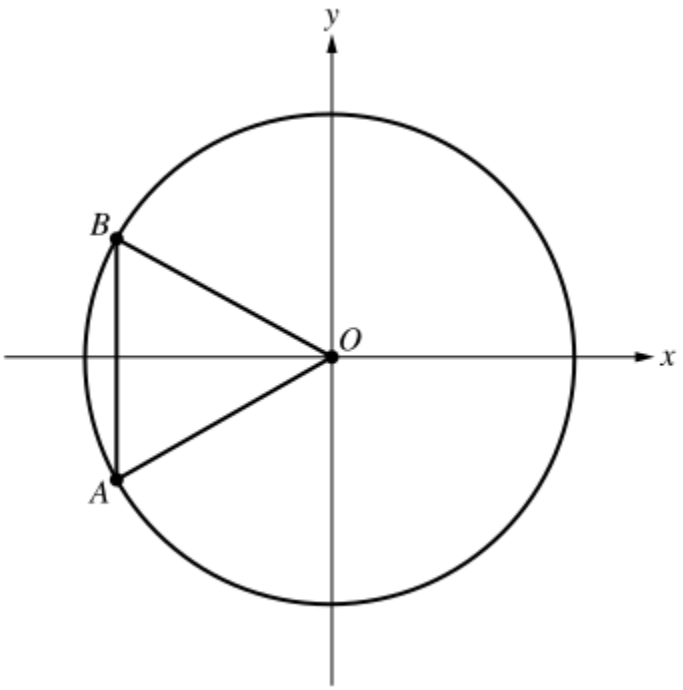
(B) f is decreasing, and the graph of f is concave up.

(C) f is increasing, and the graph of f is concave down.

(D) f is increasing, and the graph of f is concave up.

MCQ_Review_Unit_3

36.



The figure shows equilateral triangle ABO with sides of length 10 in the xy-plane. Segment AB is perpendicular to the x-axis. The terminal ray of an angle θ (not shown) in standard position passes through the point B. What is the value of $10 \sin \theta$?

(A) $-5\sqrt{3}$

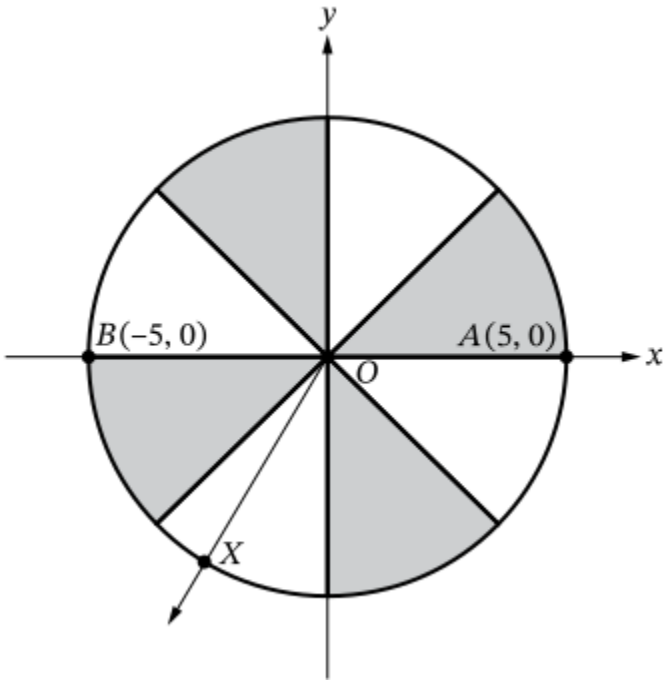
(B) $-\frac{\sqrt{3}}{2}$

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

(D) 5

MCQ_Review_Unit_3

37.



The figure shows a spinner with eight congruent sectors in the xy-plane. The origin and three points are labeled. If the coordinates of X are $\left(-\frac{5}{2}, \frac{-5\sqrt{3}}{2}\right)$, what is the measure of angle XOB ?

(A) $\frac{\pi}{6}$

(B) $\frac{\pi}{3}$

(C) $\frac{7\pi}{6}$

(D) $\frac{4\pi}{3}$

38. The functions f and g are given by $f(x) = \cos x$ and $g(x) = \sin x$. In the xy-plane, for how much of the interval $0 \leq x \leq 8\pi$ are the graphs of f and g both concave up?

(A) 0 units of x

(B) $\frac{\pi}{2}$ units of x

(C) π units of x

(D) 2π units of x

39. Which of the following describes the relationship between the graphs of $f(x) = \cos x$ and $g(x) = \sin x$ in the xy-plane?

MCQ_Review_Unit_3

(A) The graph of g is a horizontal translation of the graph of f.
(B) The graph of g is a vertical translation of the graph of f.
(C) The graph of g is a horizontal dilation of the graph of f.
(D) The graph of g is a vertical dilation of the graph of f.

40. The function f is given by $f(x) = \sin(x + c)$, where c is a constant. Which of the following statements is true?
(A) If $c = 0$, then f is an even function.
(B) If $c = \frac{\pi}{2}$, then f is an even function.
(C) If $c = 2\pi$, then f is an even function.
(D) There is no value of c for which f is an even function.

41.

Time t (hours past 12 midnight)	**Temperature ($^\circ$F)**
0	23
2	22
4	23
6	26
8	30
10	34
12	37
14	38
16	37
18	34
20	30
22	26

The table gives temperatures, in degrees Fahrenheit, in a certain town on a given day. The sinusoidal function $F(t) = 8\cos\left(\frac{\pi}{12}(t + c)\right) + 30$ models the data, where $F(t)$ is the temperature, in $^\circ$F, at time t, in hours past 12 midnight, and c is a constant. Which of the following is true about the value of c ?

MCQ_Review_Unit_3

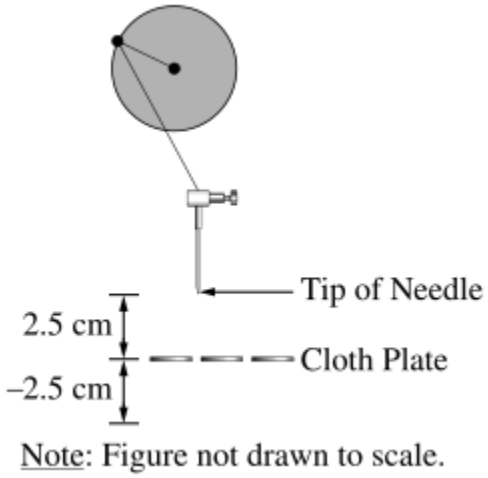
(A) The value of c is -2 because this accounts for a phase shift of $g(t) = 8\cos\left(\frac{\pi}{12}t\right) + 30$ that aligns a minimum value of the data set with a minimum value of g.

(B) The value of c is -2 because this accounts for a vertical shift of $g(t) = 8\cos\left(\frac{\pi}{12}t\right) + 30$ that aligns a minimum value of the data set with a minimum value of g.

(C) The value of c is -14 because this accounts for a phase shift of $g(t) = 8\cos\left(\frac{\pi}{12}t\right) + 30$ that aligns a maximum value of the data set with a maximum value of g.

(D) The value of c is -14 because this accounts for a vertical shift of $g(t) = 8\cos\left(\frac{\pi}{12}t\right) + 30$ that aligns a maximum value of the data set with a maximum value of g.

42.



Note: Figure not drawn to scale.

Time t (seconds)	Displacement of Tip from Cloth Plate (centimeters)
0	2.5
$\frac{1}{24}$	-2.5

The vertical motion of the tip of a needle on a sewing machine is periodic with respect to time and can be modeled by a sinusoidal function. The figure shows the location of the tip of the needle in relation to a cloth plate. The tip of the needle moves straight up and down above and below the cloth plate. The table gives a consecutive maximum and minimum displacement of the tip at two times. The function d models the displacement, in centimeters, of the tip of the needle from the cloth plate at time t, in seconds. Which of the following expressions could define $d(t)$?

(A) $2.5\cos\left(\frac{1}{12}t\right)$

(B) $2.5\cos\left(\frac{\pi}{6}t\right)$

(C) $2.5\cos(24\pi t)$

(D) $2.5\cos(48\pi t)$

43. The point P has polar coordinates $\left(10, \frac{5\pi}{6}\right)$. Which of the following is the location of point P in rectangular coordinates?

(A) $\left(-5\sqrt{3}, 5\right)$

(B) $\left(-5,5\sqrt{3}\right)$

(C) $\left(5\sqrt{3}, 5\right)$

(D) $\left(5\sqrt{3}, -5\right)$

44. In the tidal area of a certain city, a sinusoidal function $f(x) = a\sin(b(x+c)) + d$, where a, b, c, and d are constants, is used to model one cycle of high and low tides. The maximum value of the tide is 8.88 feet, and the minimum value of the tide is 0.54 feet in that cycle. If the values of b, c, and d have already been determined to fit the data, which of the following would best define $f(x)$?

(A) $4.17\sin(b(x+c)) + d$

(B) $4.44\sin(b(x+c)) + d$

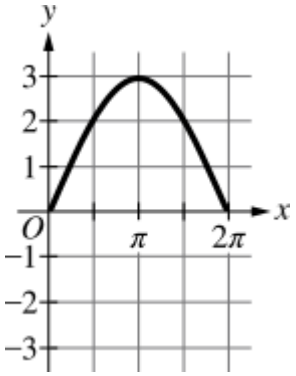
(C) $4.71\sin(b(x+c)) + d$

(D) $8.34\sin(b(x+c)) + d$

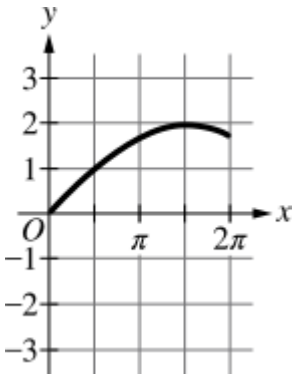
45. Which of the following is the graph of $f(x) = 3\sin(2x)$ in the xy-plane?

MCQ_Review_Unit_3

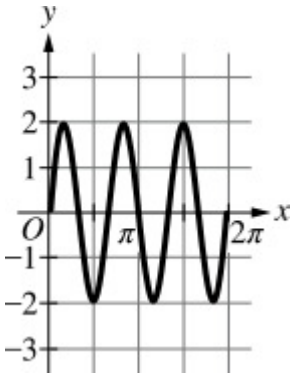
(A)



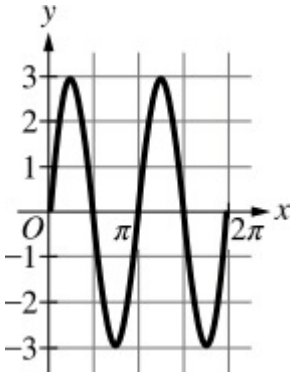
(B)



(C)



(D)



46. The function f is given by $f(x) = \sin x$. In the xy-plane, the graph of the function g is the image of the graph of f after a translation of $\frac{\pi}{6}$ units to the left. Which of the following could define $g(x)$?

MCQ_Review_Unit_3

(A) $\sin x + \frac{\pi}{6}$
(B) $\sin\left(x + \frac{\pi}{6}\right)$
(C) $\sin x - \frac{\pi}{6}$
(D) $\sin\left(x - \frac{\pi}{6}\right)$

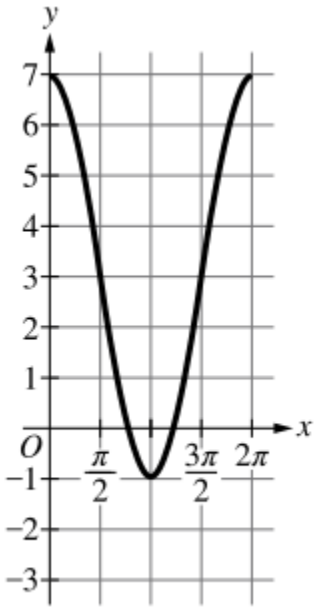
47.

Month	1	2	3	4	5	6	7	8	9
Temperature (degrees Celsius)	6.1	-5.5	-6.0	10.0	17.2	25.6	30.6	32.2	26.1

The table gives the maximum temperature, in degrees Celsius, on the first day of each of nine months in a certain city. The function f given by $f(\theta) = a\sin(b(\theta + c)) + d$, where a, b, c, and d are constants, is used to model these data with θ representing the number of the month. Assume that the period of f is 12 months. Based on the data in the table, which of the following is the best value for d?

(A) $\frac{\pi}{6}$
(B) 13
(C) 19
(D) 38

48.



Graph of f

A portion of the graph of a sinusoidal function f in the xy-plane is given for $0 \leq x \leq 2\pi$. Which of the following could define $f(x)$?

(A) $3 + 4\cos x$

(B) $3 + 4\sin x$

(C) $4 + 3\cos x$

(D) $4 + 3\sin x$

49. The function p is given by $p(\theta) = 3\tan\left(\frac{\pi}{2}(\theta + 1)\right) - 4$. What is the period of p ?

(A) $\frac{2}{\pi}$

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

(C) 2

(D) 4

50. The function g is given by $g(\theta) = \tan(2\pi\theta)$. Which of the following statements about the graph of g in the xy -plane is true?

(A) The vertical asymptotes of the graph of g occur at input values $\theta = 0 + \frac{1}{2}k$, where k is an integer.

(B) The vertical asymptotes of the graph of g occur at input values $\theta = \frac{1}{4} + \frac{1}{2}k$, where k is an integer.

(C) The vertical asymptotes of the graph of g occur at input values $\theta = \frac{1}{4} + k$, where k is an integer.

(D) The vertical asymptotes of the graph of g occur at input values $\theta = \frac{1}{2} + 2k$, where k is an integer.

MCQ_Review_Unit_3

51. The function f is given by $f(x) = a\tan(bx)$, where a and b are constants. Which of the following statements is true about the period of f ?

(A) Both the value of a and the value of b have an impact on the period of f.

(B) Only the value of a has an impact on the period of f.

(C) Only the value of b has an impact on the period of f.

(D) Neither the value of a nor the value of b has an impact on the period of f.

52. In the xy-plane, an angle θ, in standard position, has a measure of $\theta = \frac{\pi}{3}$. Which of the following is true?

(A) The slope of the terminal ray of the angle is $\frac{1}{2}$.

(B) The slope of the terminal ray of the angle is $\frac{1}{\sqrt{3}}$.

(C) The slope of the terminal ray of the angle is $\frac{\sqrt{3}}{2}$.

(D) The slope of the terminal ray of the angle is $\sqrt{3}$.

53. The function g is given by $g(x) = \tan x$. What are all solutions to $g(x) = 3$?

(A) $x = \arctan 3$ and $x = \pi + \arctan 3$ only

(B) $x = \arctan 3$ and $x = \pi + \arctan(3 + \pi)$ only

(C) $x = 2\pi k + \arctan 3$ only, where k is any integer

(D) $x = \pi k + \arctan 3$, where k is any integer

54.

x	y
-1	$-\frac{\pi}{2}$
$-\frac{1}{2}$	$-\frac{\pi}{6}$
0	0
$\frac{1}{2}$	$\frac{\pi}{6}$
1	$\frac{\pi}{2}$

The table gives ordered pairs (x, y) that are solutions to which of the following?

(A) $y = \cos x$

(B) $y = \cos^{-1} x$

(C) $y = \sin x$

(D) $y = \sin^{-1} x$

55. The number of moose in a park is modeled by the sinusoidal function M given by $M(t) = 174 + 150 \sin\left(\frac{2\pi}{365} t\right)$, where t is the number of days since January 1. Which of the following statements is true?

(A) M is decreasing on the interval $0 < t < 182$.

(B) M is decreasing on the interval $92 < t < 273$.

(C) M is decreasing on the interval $183 < t < 365$.

(D) M is decreasing on the intervals $0 < t < 91$ and $274 < t < 365$.

56. What are all values of θ, for $0 \leq \theta < 2\pi$, where $2 \sin^2 \theta = -\sin \theta$?

(A) 0, π, $\frac{\pi}{6}$, and $\frac{5\pi}{6}$

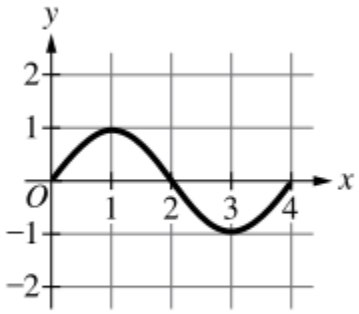
(B) 0, π, $\frac{7\pi}{6}$, and $\frac{11\pi}{6}$

(C) $\frac{\pi}{2}$, $\frac{3\pi}{2}$, $\frac{\pi}{3}$, and $\frac{5\pi}{3}$

(D) $\frac{\pi}{2}$, $\frac{3\pi}{2}$, $\frac{2\pi}{3}$, and $\frac{4\pi}{3}$

MCQ_Review_Unit_3

57.



Graph of f

The graph of the sinusoidal function f is given in the xy-plane. What is the length of the largest interval of input values of f on which an inverse function of f can be constructed?

(A) 1

(B) 2

(C) 4

(D) There is no interval larger than a single point on which f is invertible.

58.

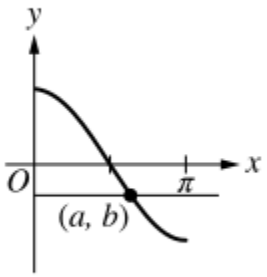
Note: Figure not drawn to scale.

The figure shows a child leaning backward and forward when riding a rocking horse. The height, in inches, between the level ground and point P is given by $h(t) = 6 + 6\cos\left(\frac{\pi}{3}t\right)$, where t is the time since the child first leans farthest back, in seconds. If the child rides the rocking horse for 5 minutes (300 seconds), how many times will point P touch the ground?

MCQ_Review_Unit_3

(A) 1
(B) 50
(C) 100
(D) 286

59.



The graphs of a trigonometric function f and a line are given in the xy-plane. The point of intersection (a, b) occurs where $f(x) = b$. For which of the following systems of equations could the point (b, a) be a solution?

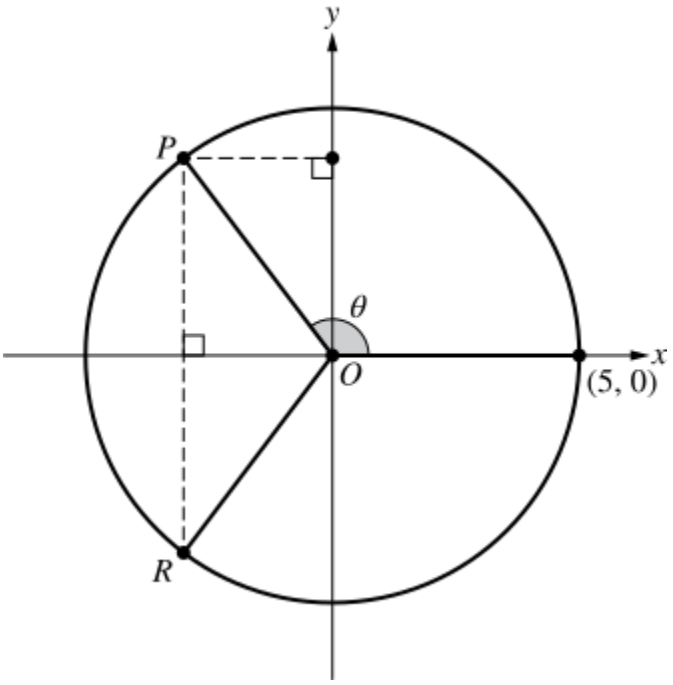
(A) $\begin{cases} y = \cos^{-1} x \\ y = b \end{cases}$
(B) $\begin{cases} y = \cos^{-1} x \\ x = b \end{cases}$
(C) $\begin{cases} y = \sin^{-1} x \\ y = b \end{cases}$
(D) $\begin{cases} y = \sin^{-1} x \\ x = b \end{cases}$

60. The function f is given by $f(x) = 5 + 7\cos x$. For what value of x on the interval $\pi < x < 2\pi$ does $f(x) = 0$?

(A) $\arccos\left(-\frac{5}{7}\right)$
(B) $\pi + \arccos\left(\frac{5}{7}\right)$
(C) $\pi + \arccos\left(\text{-}\frac{5}{7}\right)$
(D) $2\pi - \arccos\left(\frac{5}{7}\right)$

MCQ_Review_Unit_3

61.



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 R also lies on the circle. The coordinates of P are (x, y), and the coordinates of R are $(x, -y)$. Which of the following is true about the sine of θ ?

(A) $\sin\theta = \frac{x}{5}$, because it is the ratio of the horizontal displacement of P from the y-axis to the distance between the origin and P.

(B) $\sin\theta = \frac{x}{5}$, because it is the ratio of the horizontal displacement of R from the y-axis to the distance between the origin and R.

(C) $\sin\theta = \frac{-y}{5}$, because it is the ratio of the vertical displacement of R from the x-axis to the distance between the origin and R.

(D) $\sin\theta = \frac{y}{5}$, because it is the ratio of the vertical displacement of P from the x-axis to the distance between the origin and P.

62. Let $f(x) = 1 + 3\sec x$ and $g(x) = -5$. In the xy-plane, what are the x-coordinates of the points of intersection of the graphs of f and g for $0 \le x < 2\pi$?

(A) $x = \frac{\pi}{3}$ and $x = \frac{5\pi}{3}$

(B) $x = \frac{\pi}{6}$ and $x = \frac{5\pi}{6}$

(C) $x = \frac{2\pi}{3}$ and $x = \frac{4\pi}{3}$

(D) $x = \frac{7\pi}{6}$ and $x = \frac{11\pi}{6}$

63. The function f is defined by $f(\theta) = \cos(2\theta)$. Which of the following is an equivalent expression for $f(\theta)$?

(A) 1
(B) $1 - 2\cos^2\theta$
(C) $1 - 2\sin^2\theta$
(D) $2\cos\theta\sin\theta$

64. The function f is given by $f(x) = \cos\left(x + \frac{\pi}{6}\right)$. The solutions to which of the following equations on the interval $0 \le x \le 2\pi$ are the solutions to $f(x) = \frac{1}{2}$ on the interval $0 \le x \le 2\pi$?

(A) $\sqrt{3}\cos x - \sin x = 1$
(B) $\sqrt{3}\cos x + \sin x = 1$
(C) $\sqrt{3}\sin x - \cos x = 1$
(D) $\sqrt{3}\sin x + \cos x = 1$

65. In the xy-plane, the terminal ray of an angle in standard position intersects the unit circle at the point with coordinates (a, b). The terminal ray of a second angle in standard position intersects the circle at the point with coordinates (c, d). If the measure of the second angle is twice the measure of the first angle, what are the coordinates c and d, in terms of a and b ?

(A) $c = -b$ and $d = -a$
(B) $c = 2a$ and $d = 2b$
(C) $c = a^2 + b^2$ and $d = 2ab$
(D) $c = a^2 - b^2$ and $d = 2ab$

66. The function g is defined by $g(x) = \sec^2 x + \tan x$. What are all solutions to $g(x) = 1$ on the interval $0 \le x \le 2\pi$?

(A) $x = 0$, $x = \frac{3\pi}{4}$, $x = \pi$, $x = \frac{7\pi}{4}$, and $x = 2\pi$ only
(B) $x = \frac{\pi}{4}$, $x = \frac{\pi}{2}$, $x = \frac{5\pi}{4}$, and $x = \frac{3\pi}{2}$ only
(C) $x = \pi k$ and $x = -\frac{\pi}{4} + \pi k$, where k is any integer
(D) $x = \frac{\pi}{2} + \pi k$ and $x = \frac{\pi}{4} + \pi k$, where k is any integer

67. The function f is given by $f(x) = \sin^2 x + \cos x + 1$. The solutions to which of the following equations are also the solutions to $f(x) = 0$?

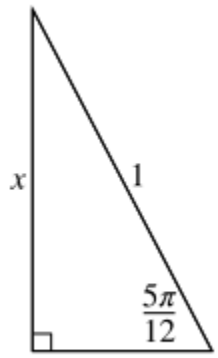
(A) $\cos^2 x + \cos x = 0$
(B) $\cos^2 x - \cos x - 2 = 0$
(C) $\cos^2 x + \cos x + 2 = 0$
(D) $\sin^2 x - \sin x + 2 = 0$

68. The function f is given by $f(x) = \cos x\left(1 + \tan^2 x\right)$. Which of the following expressions is equivalent to $f(x)$?

MCQ_Review_Unit_3

(A) $\sec x$
(B) $\cos^3 x$
(C) $\tan x \sec x$
(D) $\cot x \csc x$

69.



The figure is a right triangle with a hypotenuse of length 1, a side of length x, and the angle opposite that side with measure $\frac{5\pi}{12}$. Using the fact that $\frac{5\pi}{12} = \frac{3\pi}{12} + \frac{2\pi}{12}$, which of the following is the value of x ?

(A) $\left(\frac{\sqrt{2}}{2}\right)\left(\frac{\sqrt{2}}{2}\right) + \left(\frac{1}{2}\right)\left(\frac{\sqrt{3}}{2}\right)$
(B) $\left(\frac{\sqrt{2}}{2}\right)\left(\frac{\sqrt{3}}{2}\right) + \left(\frac{\sqrt{2}}{2}\right)\left(\frac{1}{2}\right)$
(C) $\left(\frac{\sqrt{2}}{2}\right)\left(\frac{\sqrt{3}}{2}\right) - \left(\frac{\sqrt{2}}{2}\right)\left(\frac{1}{2}\right)$
(D) $\left(\frac{\sqrt{2}}{2}\right)\left(\frac{1}{2}\right) - \left(\frac{\sqrt{2}}{2}\right)\left(\frac{\sqrt{3}}{2}\right)$

70. The function f is given by $f(x) = \sin\left(x + \frac{4\pi}{3}\right)$. What is the value of $f\left(\frac{3\pi}{4}\right)$?

(A) $\frac{-\sqrt{6}-\sqrt{2}}{4}$
(B) $\frac{\sqrt{2}+\sqrt{6}}{4}$
(C) $\frac{\sqrt{2}-\sqrt{6}}{4}$
(D) $\frac{\sqrt{6}-\sqrt{2}}{4}$

71. The cosine function is a horizontal translation of the sine function with $\sin\left(x + \frac{\pi}{2}\right) = \cos x$. Which of the following identities can be used to verify this identity by direct substitution and evaluation without additional algebraic manipulation?

MCQ_Review_Unit_3

(A) The sum identity for sine
(B) The sum identity for cosine
(C) The double-angle identity for sine
(D) The double-angle identity for cosine

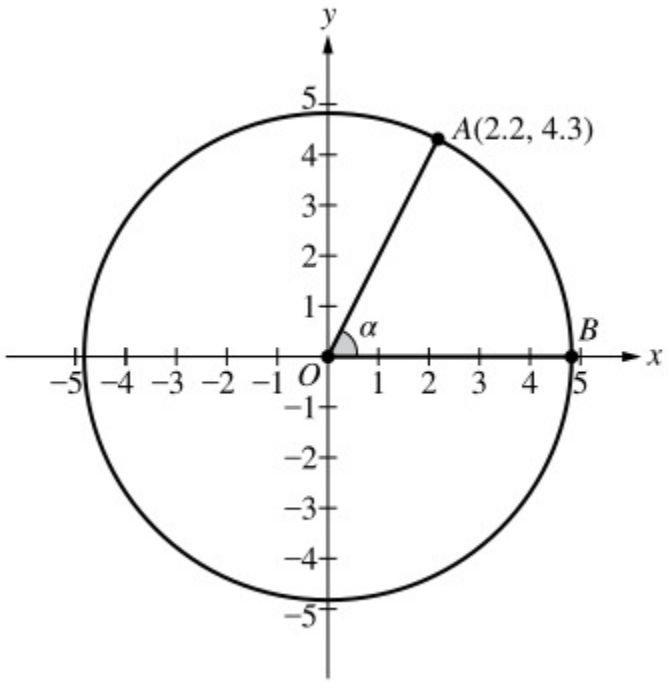
72. The function g is given by $g(x) = 7\sin(2x)$. Which of the following is an equivalent form for $g(x)$?

(A) $g(x) = 14\cos x \sin x$
(B) $g(x) = (7\cos x)(7\sin x)$
(C) $g(x) = 7\cos^2 x - 7\sin^2 x$
(D) $g(x) = 7 - 14\sin^2 x$

73. What are all values of θ, $-\pi \leq \theta \leq \pi$, for which $2\cos\theta > -1$ and $2\sin\theta > \sqrt{3}$?

(A) $-\frac{5\pi}{6} < \theta < \frac{5\pi}{6}$
(B) $\frac{\pi}{6} < \theta < \frac{5\pi}{6}$ only
(C) $-\frac{2\pi}{3} < \theta < \frac{2\pi}{3}$ only
(D) $\frac{\pi}{3} < \theta < \frac{2\pi}{3}$ only

74.



The figure gives a circle of radius 4.8 in the xy-plane with center at the origin, an angle α in standard position, and three labeled points. Which of the following is the value of $\sin\alpha$?

MCQ_Review_Unit_3

(A) $\frac{2.2}{4.8}$

(B) $\frac{4.3}{4.8}$

(C) 2.2

(D) 4.3

75. In the xy-plane, angle BAC is an angle in standard position with terminal ray AC, which intersects the unit circle at the point with coordinates $(0.4, -0.9)$. Which of the following descriptions is correct?

(A) The tangent of angle BAC is $-\frac{4}{9}$, and the slope of ray AC is $-\frac{4}{9}$.

(B) The tangent of angle BAC is $-\frac{4}{9}$, and the slope of ray AC is $-\frac{9}{4}$.

(C) The tangent of angle BAC is $-\frac{9}{4}$, and the slope of ray AC is $-\frac{9}{4}$.

(D) The tangent of angle BAC is $-\frac{9}{4}$, and the slope of ray AC is $\frac{4}{9}$.

76. 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 $\tan\theta = 1$?

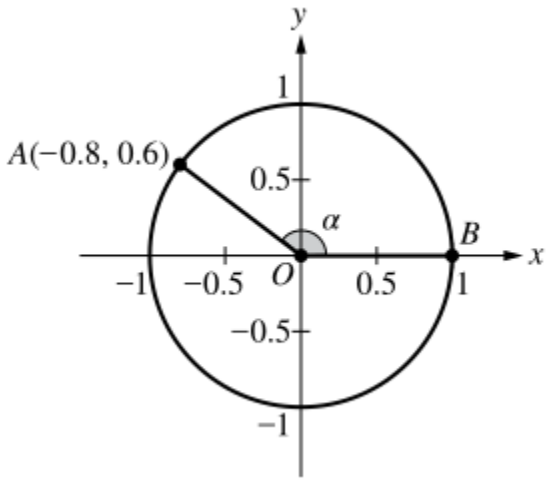
(A) There is a value of θ on $0 \leq \theta \leq 2\pi$ for which $\tan\theta = 1$ in Quadrant I only.

(B) There are values of θ on $0 \leq \theta \leq 2\pi$ for which $\tan\theta = 1$ in Quadrants I and III only.

(C) There are values of θ on $0 \leq \theta \leq 2\pi$ for which $\tan\theta = 1$ in all four Quadrants.

(D) There is no value of θ on $0 \leq \theta \leq 2\pi$ for which $\tan\theta = 1$.

77.



The figure shows a unit circle in the xy-plane, an angle α in standard position, and three labeled points. Which of the following is the value of $\cos\alpha$?

(A) -0.8
(B) -0.6
(C) 0.6
(D) 0.8

78. Consider the graph of the polar function $r = f(\theta)$, where $f(\theta) = 1 + 2\sin\theta$, in the polar coordinate system for $0 \le \theta \le 2\pi$. Which of the following statements is true about the distance between the point with polar coordinates $(f(\theta), \theta)$ and the origin?

(A) The distance is increasing for $0 \le \theta \le \frac{\pi}{2}$, because $f(\theta)$ is positive and increasing on the interval.
(B) The distance is increasing for $\frac{3\pi}{2} \le \theta \le \frac{11\pi}{6}$, because $f(\theta)$ is negative and increasing on the interval.
(C) The distance is decreasing for $0 \le \theta \le \frac{\pi}{2}$, because $f(\theta)$ is positive and decreasing on the interval.
(D) The distance is decreasing for $\frac{3\pi}{2} \le \theta \le \frac{11\pi}{6}$, because $f(\theta)$ is negative and decreasing on the interval.

79. A polar function is given by $r = f(\theta) = -1 + \sin\theta$. As θ increases on the interval $0 < \theta < \frac{\pi}{2}$, which of the following is true about the points on the graph of $r = f(\theta)$ in the xy-plane?

(A) The points on the graph are above the x-axis and are getting closer to the origin.
(B) The points on the graph are above the x-axis and are getting farther from the origin.
(C) The points on the graph are below the x-axis and are getting closer to the origin.
(D) The points on the graph are below the x-axis and are getting farther from the origin.

80. Consider the graph of the polar function $r = f(\theta)$, where $f(\theta) = \theta(\theta - 2)(\theta - 4)$, in the polar coordinate system for $0 \le \theta \le 4$. Which of the following statements is true?

(A) On the interval $2 < \theta < 2.1$, the distance between $(f(\theta), \theta)$ and the origin is increasing because the values of $f(\theta)$ are negative and decreasing.
(B) On the interval $2 < \theta < 2.1$, the distance between $(f(\theta), \theta)$ and the origin is decreasing because the values of $f(\theta)$ are negative and decreasing.
(C) On the interval $2 < \theta < 2.1$, the distance between $(f(\theta), \theta)$ and the origin is increasing because the values of $f(\theta)$ are negative and increasing.
(D) On the interval $2 < \theta < 2.1$, the distance between $(f(\theta), \theta)$ and the origin is decreasing because the values of $f(\theta)$ are negative and increasing.

81. Consider the graph of the polar function $r = f(\theta)$, where $f(\theta) = 2\sin\theta - 1$, in the polar coordinate system. Which of the following descriptions is true?

(A) As θ increases from 0 to $\frac{\pi}{6}$, the polar function $r = f(\theta)$ is increasing, and the distance between the point $(f(\theta), \theta)$ on the curve and the origin is increasing.
(B) As θ increases from 0 to $\frac{\pi}{6}$, the polar function $r = f(\theta)$ is increasing, and the distance between the point $(f(\theta), \theta)$ on the curve and the origin is decreasing.
(C) As θ increases from 0 to $\frac{\pi}{6}$, the polar function $r = f(\theta)$ is decreasing, and the distance between the point $(f(\theta), \theta)$ on the curve and the origin is increasing.
(D) As θ increases from 0 to $\frac{\pi}{6}$, the polar function $r = f(\theta)$ is decreasing, and the distance between the point $(f(\theta), \theta)$ on the curve and the origin is decreasing.

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82. The function f is given by $f(x) = 3\cos(\pi x)$, where $0 \le x \le 1$. Which of the following gives $f^{-1}(x)$?

(A) $3\cos^{-1}(\pi x), -3 \le x \le 3$

(B) $\frac{1}{3\cos(\pi x)}, -3 \le x \le 3$

(C) $\pi\cos^{-1}\left(\frac{x}{3}\right), -3 \le x \le 3$

(D) $\frac{1}{\pi}\cos^{-1}\left(\frac{x}{3}\right), -3 \le x \le 3$

83. Part of a video game design involves the use of one period of a sinusoidal function as the path that a spaceship will follow across a rectangular video screen. The video screen has a width of 1000 pixels and a height of 600 pixels. The values $x = 0$ and $x = 1000$ represent the left and right sides of the screen, respectively. The values $y = 0$ and $y = 600$ represent the bottom and top sides of the screen, respectively.

The path of the spaceship begins on the left side of the screen, $x = 0$, and completes one period of a sinusoidal function by ending on the right side of the screen, $x = 1000$. During its path, the spaceship reaches its minimum height of $y = 200$ before reaching its maximum height of $y = 500$. If $y = f(x)$ models the path of the spaceship, which of the following could define $f(x)$?

(A) $-300\sin\left(\frac{\pi}{500}x\right) + 350$

(B) $-150\sin\left(\frac{\pi}{500}x\right) + 350$

(C) $150\sin\left(\frac{\pi}{500}x\right) + 350$

(D) $300\sin\left(\frac{\pi}{500}x\right) + 350$

84. Consider the graph of the polar function $r = f(\theta)$, where $f(\theta) = \frac{3\theta^3+50}{2\theta^4+5}$, in the polar coordinate system. Which of the following is true?

(A) Because $\lim_{\theta\to\infty} f(\theta) = -\infty$, points on the graph of $r = f(\theta)$ will be arbitrarily close to the origin for sufficiently large values of θ.

(B) Because $\lim_{\theta\to\infty} f(\theta) = 0$, points on the graph of $r = f(\theta)$ will be arbitrarily close to the origin for sufficiently large values of θ.

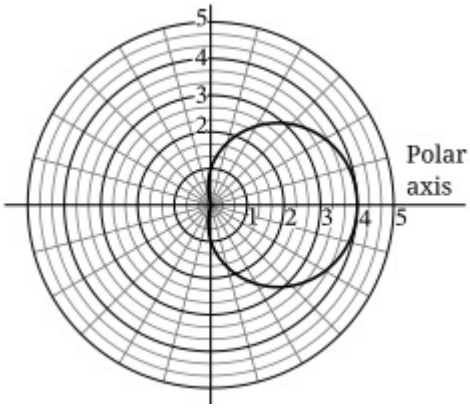
(C) Because $\lim_{\theta\to\infty} f(\theta) = \frac{3}{2}$, points on the graph of $r = f(\theta)$ will be arbitrarily close to the polar curve $r = \frac{3}{2}$ for sufficiently large values of θ.

(D) Because $\lim_{\theta\to\infty} f(\theta) = \infty$, points on the graph of $r = f(\theta)$ will be increasingly distant from the origin for sufficiently large values of θ.

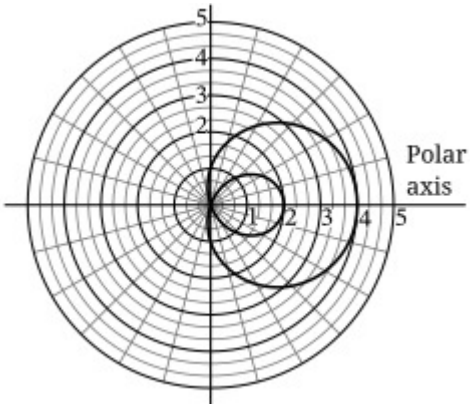
85. Which of the following is the graph of the polar function $r = f(\theta)$, where $f(\theta) = 3\cos\theta + 2$, in the polar coordinate system for $0 \le \theta \le 2\pi$?

MCQ_Review_Unit_3

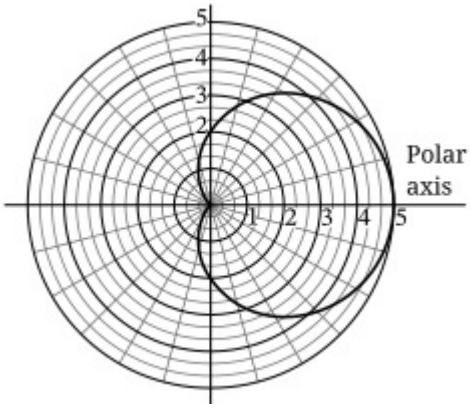
(A)



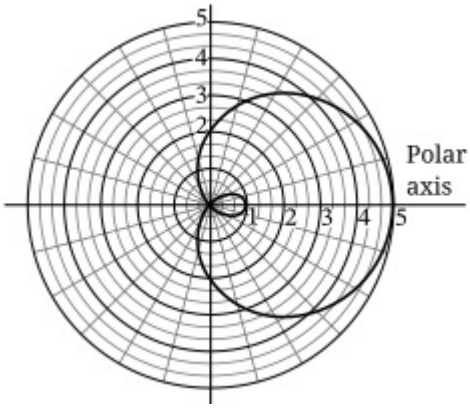
(B)



(C)

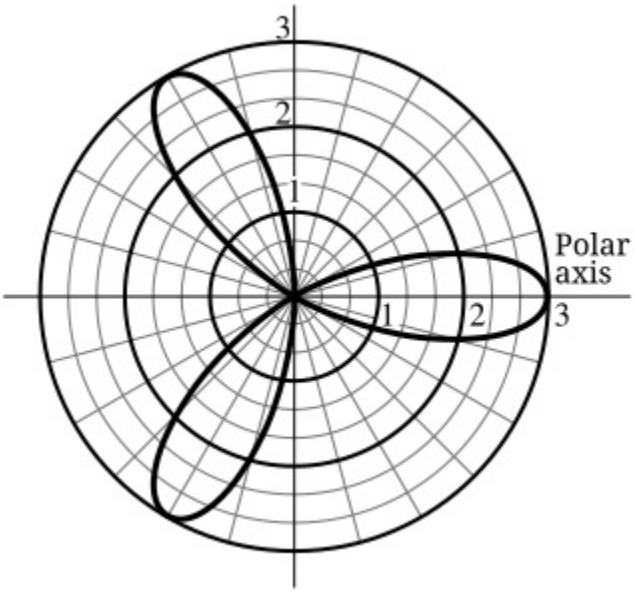


(D)



MCQ_Review_Unit_3

86.



The graph of the polar function $r = f(\theta)$ is given in the polar coordinate system. Which of the following defines $f(\theta)$ for $0 \leq \theta \leq 2\pi$?

(A) $3 + \cos(3\theta)$

(B) $3\cos(3\theta)$

(C) $3 + \sin(3\theta)$

(D) $3\sin(3\theta)$

87. The polar function $r = f(\theta)$, where $f(\theta) = \frac{2}{\theta}$, is defined for $\theta \geq 1$. Which of the following describes the graph of $r = f(\theta)$ in the polar coordinate system?

(A) The graph of $r = f(\theta)$ is a line along the polar axis (x-axis) for which increasing angle measures correspond to decreasing radii.

(B) The graph of $r = f(\theta)$ is a line along the polar axis (x-axis) for which increasing angle measures correspond to increasing radii.

(C) The graph of $r = f(\theta)$ is a spiral for which increasing angle measures correspond to decreasing radii.

(D) The graph of $r = f(\theta)$ is a spiral for which increasing angle measures correspond to increasing radii.

88. Let $r = f(\theta)$ be a polar function, where $f(\theta) = 5$. The graph of $r = f(\theta)$ for $0 \leq \theta \leq \pi$ appears as a semicircle in the polar coordinate system. The graph of which of the following polar functions in the polar coordinate system is the same semicircle?

(A) $r = g(\theta)$, where $g(\theta) = -5$ for $0 \leq \theta \leq \pi$

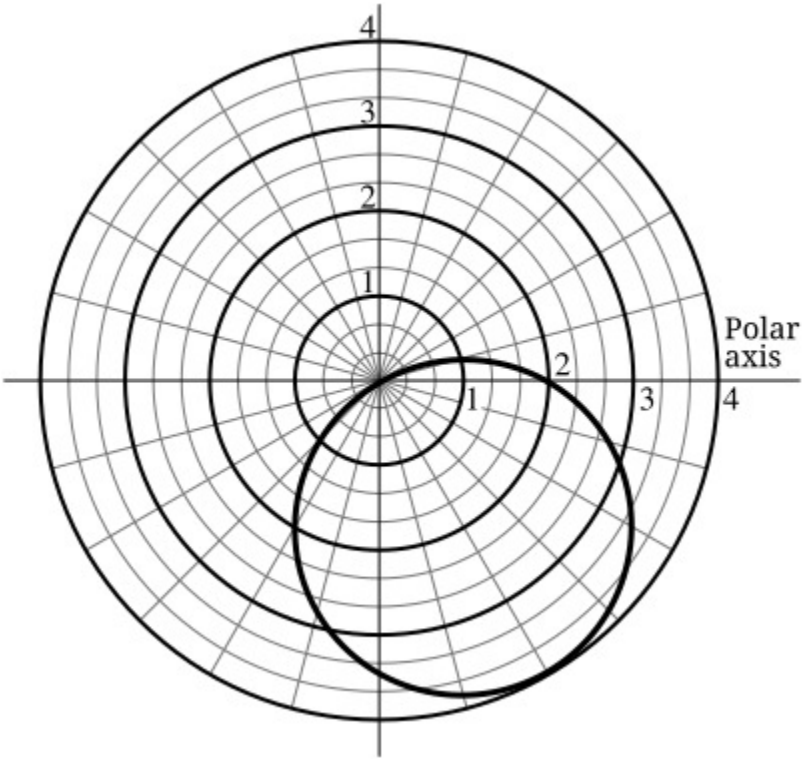
(B) $r = h(\theta)$, where $h(\theta) = \frac{1}{5}$ for $0 \leq \theta \leq \pi$

(C) $r = k(\theta)$, where $k(\theta) = -5$ for $\pi \leq \theta \leq 2\pi$

(D) $r = m(\theta)$, where $m(\theta) = \frac{1}{5}$ for $\pi \leq \theta \leq 2\pi$

MCQ_Review_Unit_3

89.



The graph of the polar function $r = g(\theta)$, where $g(\theta) = 4\cos\left(\theta + \frac{\pi}{3}\right)$, is given in the polar coordinate system. Which of the following descriptions is true?

(A) Values of θ for $\frac{\pi}{2} < \theta < \pi$ correspond to the portion of the graph of $r = g(\theta)$ in Quadrant I.

(B) Values of θ for $\frac{\pi}{2} < \theta < \pi$ correspond to the portion of the graph of $r = g(\theta)$ in Quadrant II.

(C) Values of θ for $\frac{\pi}{2} < \theta < \pi$ correspond to the portion of the graph of $r = g(\theta)$ in Quadrant III.

(D) Values of θ for $\frac{\pi}{2} < \theta < \pi$ correspond to the portion of the graph of $r = g(\theta)$ in Quadrant IV.

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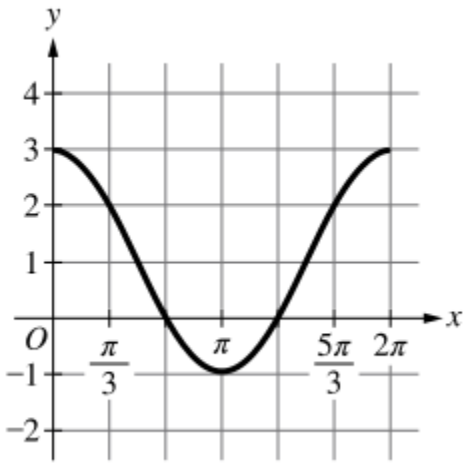
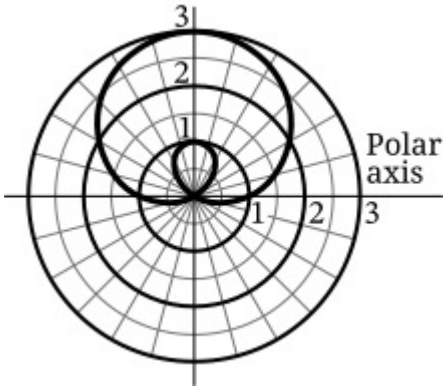
90.



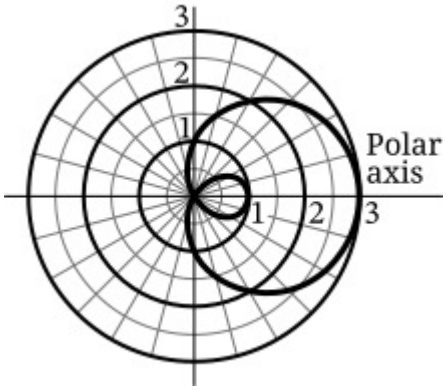
The graph of the function $y = f(x)$ is shown in the xy-plane. Which of the following is the graph of the polar function $r = f(\theta)$ in the polar coordinate system?

MCQ_Review_Unit_3

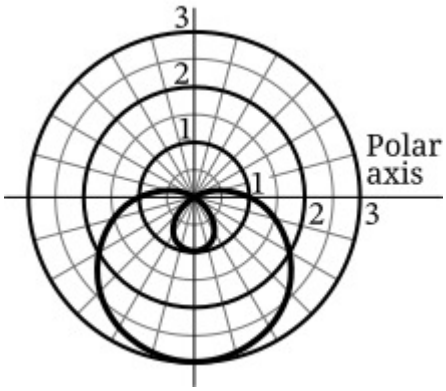
(A)



(B)



(C)



(D)