Abdul Qader Al Jazaeri School

عام التسامح
YEAR OF TOLERANCE

Student Name ..... **Section** .....

Grade 12 General

تحذير هام

هذه الأوراق بمثابة دفتر مساعد للطالب لتوفير الوقت في كتابة السؤال ولكن الحذر كل الحذر من الاستغناء بها فقط حيث أن كتاب الوزارة هو المرجع الأساسي في كل شيء وعلى الطالب أن يتدرب على حل التمارين الواردة في الكتاب المدرسي الموجودة نهاية كل درس ويناقش المعلم بها

Final Revision

Math Department

Semester 1

2019-2020

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If $f(x) = 2x^2 - x$ find $f(5)$

a) 20 b) 45

c) 5 d) 55

Which of the following functions is odd

a) $f(x) = 5x^3$ b) $f(x) = x^2 - 16$

c) $f(x) = x^3 + 1$ d) $f(x) = x^4 + 2x$

Which functions has a removable discontinuity

a) $f(x) = x^2 - 4$ b) $f(x) = \dfrac{1}{x-7}$

c) $f(x) = \dfrac{x^2 - 25}{x-5}$ d) $f(x) = \dfrac{x-1}{x+3}$

Which function is the parent function for $g(x) = -3|x+9|$

a) $f(x) = 3|x|$ b) $f(x) = |x+9|$

c) $f(x) = 3|x+9|$ d) $f(x) = |x|$

If $f(x) = 6 - x$, $g(x) = 4x + 1$

Find $(f+g)(x)$

a) $3x+5$ b) $3x+7$

c) $x+5$ d) $x+7$

Which function has a removable discontinuity?

a) $f(x) = \dfrac{x}{x+3}$ b) $f(x) = \dfrac{x^2 - 4}{x+2}$

c) $f(x) = \dfrac{1}{x+3}$ d) $f(x) = x^3 - 3$

If $f(x)=1-x^2$ and $g(x)=4-x^2$, find $(f-2g)(x)$.

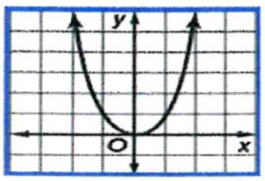
a) $(f-2g)(x)=3$

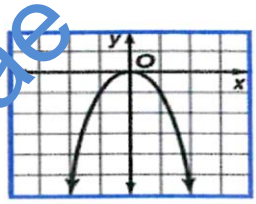
b) $(f-2g)(x)=x^2-7$

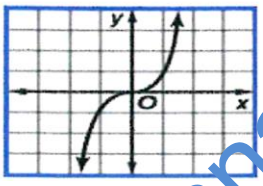
c) $(f-2g)(x)=-3$

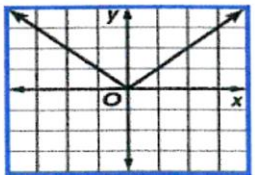
d) $(f-2g)(x)=8-3x^2$

Which of the following represents the graph of $f(x)=|x^3|$?

a) 

b) 

c) 

d) 

) Which of the following functions is odd?

a) $f(x)=x^4+4x$

b) $f(x)=x^4-9$

c) $f(x)=2x^3$

d) $f(x)=-x^3+4$

If $f(x)=\begin{cases}-4x & ,x<-1\\ x^3-1 & ,x\geq -1\end{cases}$, find $f(-1)$.

a) -4 b) 2

c) 4 d) -2

4) Find the average rate of change of the function $g(x)=8x^2-2x$ over $[-1,1]$.

a) -2 b) 0

c) 2 d) ∞

Find the average rate of change of the function

$h(x)=3x^2-8x+2\,,[-1\,,3]$

7) What is the maximum number of turning points for the function

$f(x)=6x^4+11x^3-x^2+x2$

a) 4 b) 3

c) 2 d) 6

What is the maximum number of real zeros of the function

$f(x)=2x^3-2x^2-x+m$

a) 3 b) 4

c) 1 d) 2

8) Determine the binomial that is a factor of $f(x)=x^4-9x^2-7x+6$.

a) $x-1$ b) $x+1$

c) $x+2$ d) $x-2$

Which one is a rational zero for the function

$f(x)=3x^3-17x^2+23x-27$?

a) $\frac{1}{9}$ b) $\frac{27}{17}$

c) 9 d) $\frac{27}{23}$

Which function has invers function

a) $f(x)=x^2$ b) $f(x)=x^3$

c) $f(x)=\frac{1}{x^4}$ d) $f(x)=|x|$

Which is the solution for the inequatlity $(x+3)(x-2)\le 0$?

a) $[-3,2]$ b) $(-\infty,-3]\cup[2,\infty)$

c) $(-3,2)$ d) $(-\infty,-3)\cup(2,\infty)$

Solve

$$x^2-8 \le 2x-5$$

Solve

$$\frac{3x}{x+6}-1=0$$

Solve

$$25^{3x+2}=5^{x-1}$$

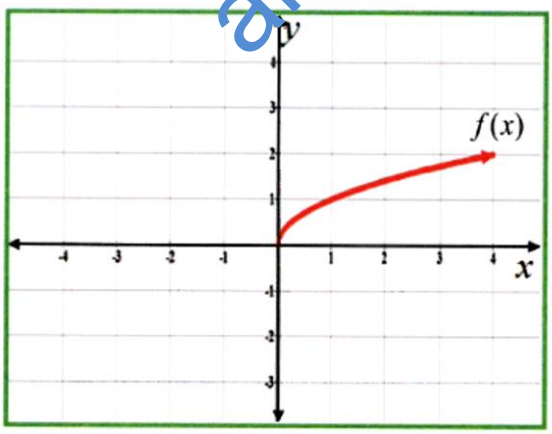
Find the value of $3\ln e^4 - e^{\ln 2}$.

a) 10 b) -6

c) 24 d) -10

Use the graph of $f(x)=\sqrt{x}$ **to sketch the graph of**

$$g(x)=\sqrt{x-2}+1$$



Find the domain of the function

$y = \log(x - 4)$

a) $(4, \infty)$ b) $(-4, \infty)$

c) $(-\infty, 4)$ d) $(-4, 4)$

Solve the equation $\log_4(x^2 - 5) = \log_4 10 + \log_4 2$.

a) $x = \pm 25$ b) $x = 25$

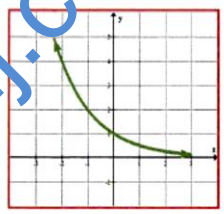
c) $x = 5$ d) $x = \pm 5$

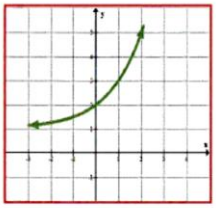
Find the value of $34\ ln\ e^{0.5} - 4\ ln\ e^5$

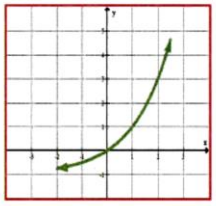
a) 37 b) -340

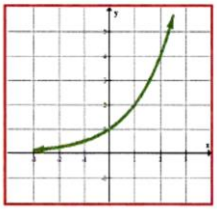
c) 150 d) -3

Which graph represent the graph of $f(x) = 2^x$

a) 

b) 

c) 

d) 

Write in simplest form

$$7\ \log_3 x - \log_3(6 - x)$$

Expand $\log 2a^4b^{-9}$

Find the value of $cos\ (tan^{-1}1)$

a) $\frac{-1}{\sqrt{2}}$ b) $\frac{1}{\sqrt{2}}$

c) 0 d) 1

13) Find the exact value of $\cos^{-1}\left(\frac{1}{2}\right)$ if it exists.

a) $\frac{\pi}{3}$ b) $\frac{\pi}{6}$

c) $\frac{\pi}{2}$ d) Does not exist

Determine the vertical shift

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

a) -4 b) 3

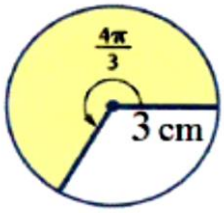
c) 8π d) 4

12) Determine the amplitude of $y=-3\sin(4x+\pi)+1$.

a) $\frac{-\pi}{4}$ b) -2

c) 2 d) 1

Find the area of the shaded region



a) 12π b) 4π

c) 6π d) 2π

14) Find the length of an arc in a circle with radius 6 cm if the central angle is $\theta=\frac{\pi}{3}$.

a) π b) 2π

c) 3π d) 6π

Write in simplest form

$$\frac{\cos^2 x}{\csc^2 x - 1}$$

a) $\sin^2 x$ b) $-\cos^2 x$

c) $\frac{\cos^2 x}{\cot^2 x - 1}$ d) $\frac{\sin^2 x}{\cot^2 x - 1}$

15) Which of the following is an identity?

a) $\frac{\tan^2 x}{1+\sec x} = \sec x + 1$

b) $\sin^2 x - 2 = -\sin x$

c) $\tan x + \cot x = \csc x$

d) $2\sin^2 x - 1 = 1 - 2\cos^2 x$

Find all solution for the equation

$1 - \cos x = 2\sin^2 x$ $, [0, \pi]$

$\sin 49^\circ \cos 19^\circ - \cos 49^\circ \sin 19^\circ$.

a) $\sqrt{3}$ b) $\frac{\sqrt{3}}{2}$

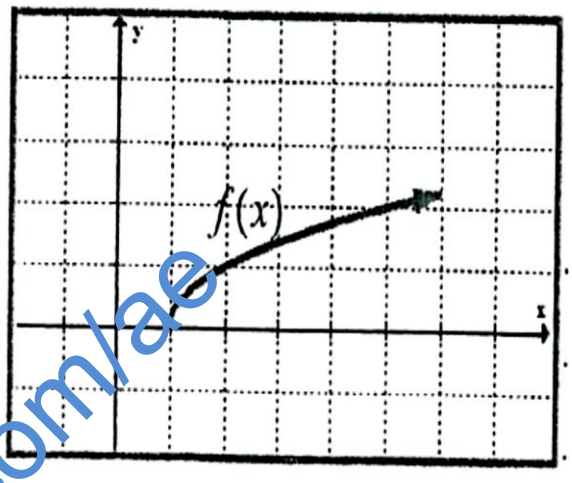
c) $\frac{1}{\sqrt{2}}$ d) $\frac{1}{2}$

Show that

$f(x) = \frac{x+4}{x}$, $g(x) = \frac{x}{x-1}$ **are inverse function**

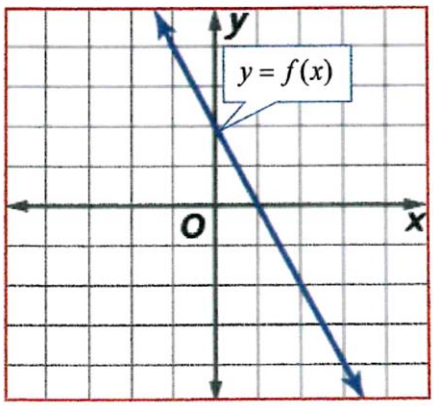
Use the graph of $f(x) = \sqrt{x-1}$ **to answer the question below**

1) **Determine and classify the absolute extreme value**
2) **Find and graph** $f^{-1}(x)$

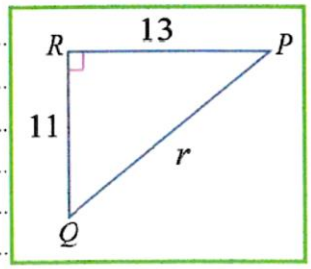


Write in standard form of the least degree with real coefficients having among its zeros $\sqrt{5}$, $-\sqrt{5}$, $3i$

Use the graph of $f(x)$ **to graph its inverse function.**



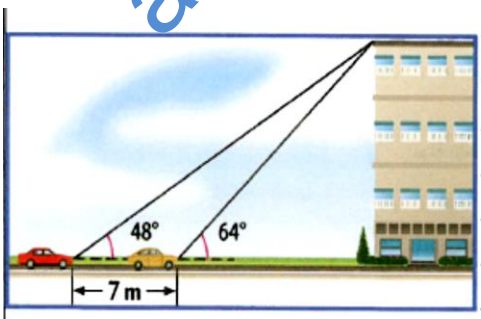
Solve the triangle ΔRPQ. Round side lengths to the nearest tenth and angle measures to the nearest degree.



Write in standard from a polynomial of the least degree with real coefficients having among its zeros $\sqrt{3}, -\sqrt{3}$, and $2i$.

Verify the identity $\dfrac{1}{1+\cos x}+\dfrac{1}{1-\cos x}=2\csc^2 x$.

Use the information to find the height of the building



Verify the identity

$$\frac{1}{1+\tan^2 x}+\frac{1}{1+\cot^2 x}=1$$

Determine the domain of the function $g(x)=\dfrac{3x^2-4}{x^2-1}$ **, as well as the vertical and horizontal asymptotes if they exist.**

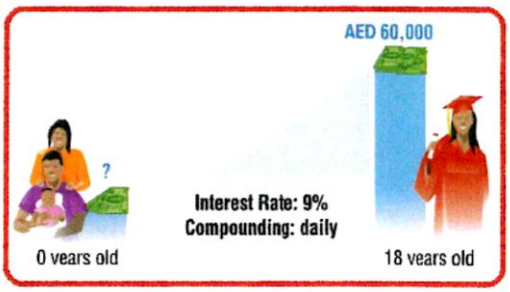
For the function $h(x)=\frac{x^2-1}{x^2+x-2}$

Determine

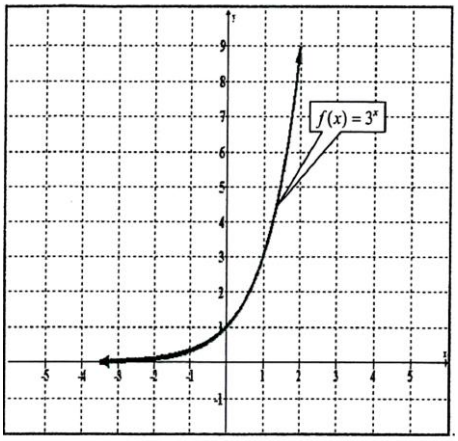
1) **Vertical asymptote**
2) **Horizontal asymptote**
3) **The hole of** $h(x)$
4) **X-intercepts**

Ali invests AED 3500 in account with 8% interest rate, making no other deposits or withdrawals. What will Ali's account balance be after 15 years if the interest is compound semiannually?

A married couple just had a child and wants to immediately start a college fund. Use the information below to determine how much money they should invest.



Use the graph of the function $f(x) = 3^x$ to answer



1) Determine the domain
2) Determine the range
3) Find y- intercepts
4) Continuity
5) End behavior
6) Increasing intervals
7) Decreasing intervals
8) Is it show growth or decay (explain)?
9) Describe the transformation of the function

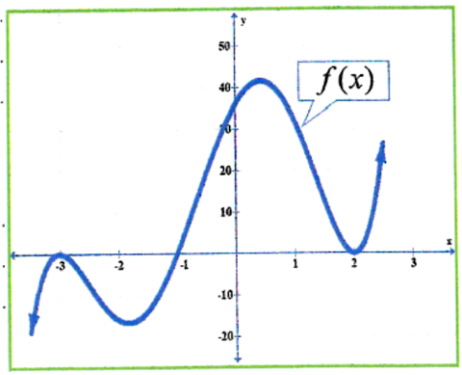
$p(x) = -4(3^x)$

If $f(x) = 2x - 5$ and $g(x) = x^2 + 1$, determine $[f \circ g](1)$.

.....

21) a) Determine the least possible degree of the polynomial $f(x)$ graphed below.

.....



b) Determine the end behavior of the function $f(x)$.

.....

c) Determine the zeros of $f(x)$.

.....

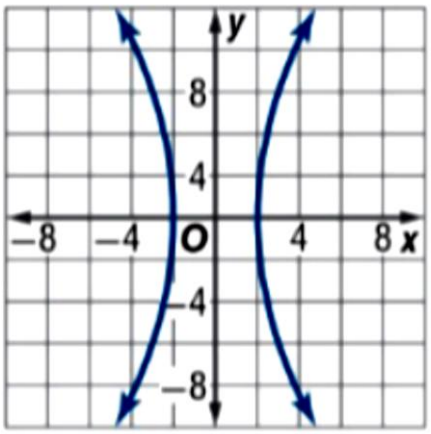
Determine whether each relation represents *y* as a function of *x*.

1. $3x + 7y = 21$

2.

x	−1	1	3	5	7
y	−1	3	7	11	15

3.



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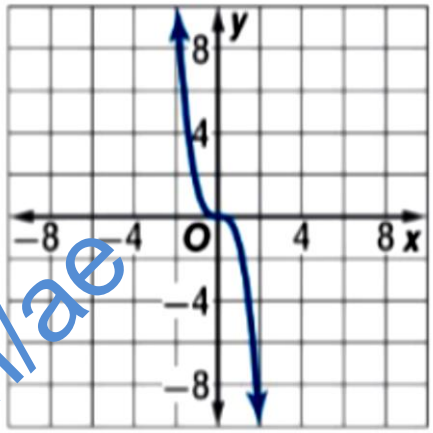


5. Evaluate $f(2)$ for $f(x) = \begin{cases} x^2 - 3x & \text{if } x < 2 \\ x - 10 & \text{if } x \geq 2 \end{cases}$

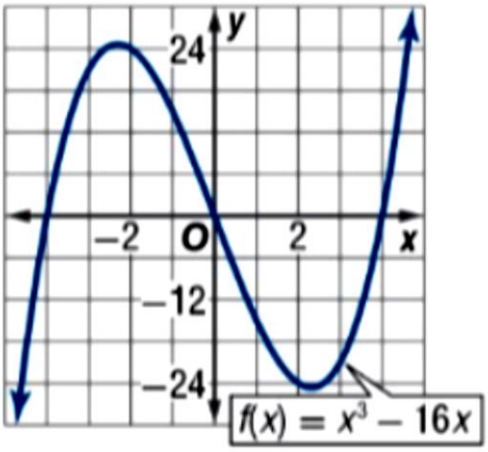
6. **SPORTS** During a baseball game, a batter pops up the ball to the infield. After t seconds the height of the ball in feet can be modeled by $h(t) = -16t^2 + 50t + 5$.

a. What is the baseball's height after 3 seconds?

b. What is the relevant domain of this function? Explain your reasoning.

Use the graph of each function to find its *y*-intercept and zero(s). Then find these values algebraically.

7.



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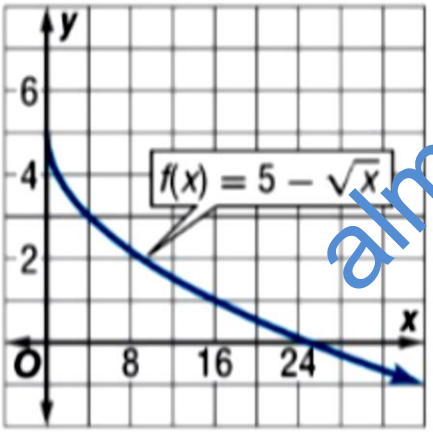
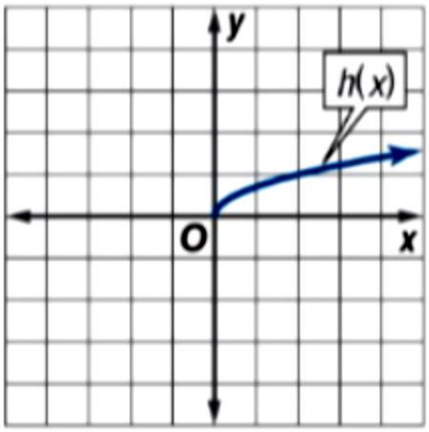


Use the graph of *h* to find the domain and range of each function.

9.



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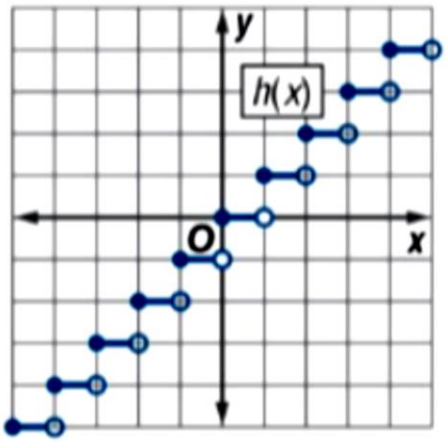


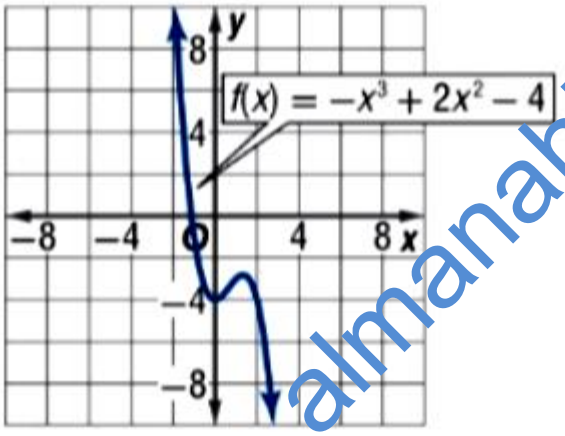
Determine whether each function is continuous at $x = 5$. Justify your answer using the continuity test.

11. $f(x) = \sqrt{x^2 - 36}$

12. $f(x) = \dfrac{x^2}{x+5}$

Use the graph of each function to describe its end behavior.

13.



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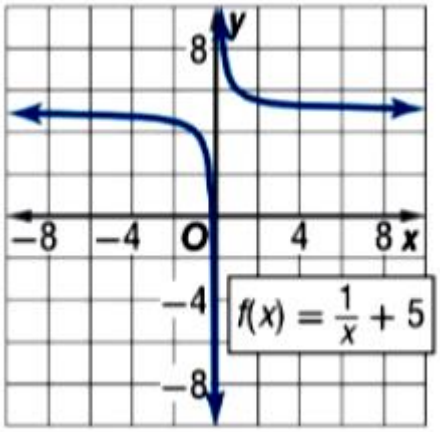


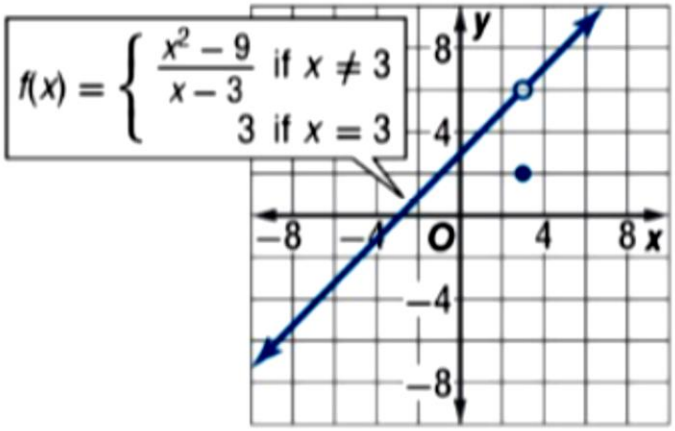
15. MULTIPLE CHOICE The graph of $f(x)$ contains a(n) _____ discontinuity at $x = 3$.

A undefined

B infinite

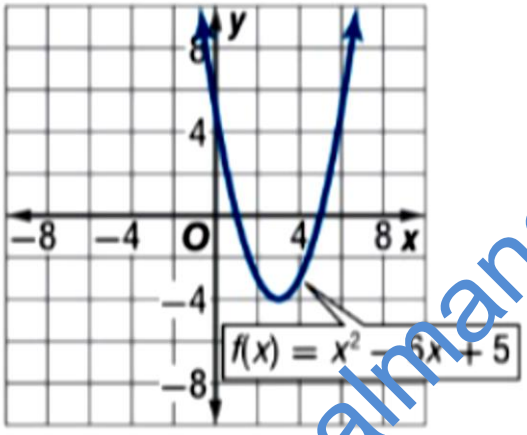
C jump

D removable



Use the graph of each function to estimate intervals to the nearest 0.5 unit on which the function is increasing, decreasing, or constant.

16.



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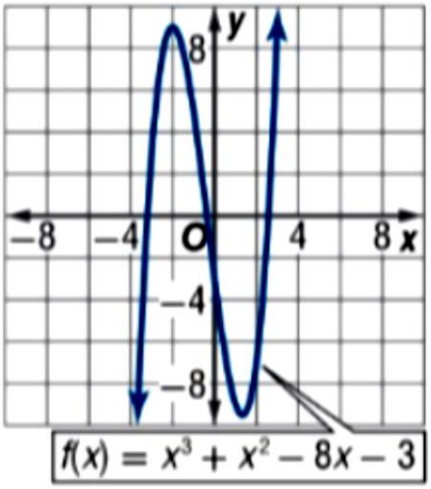
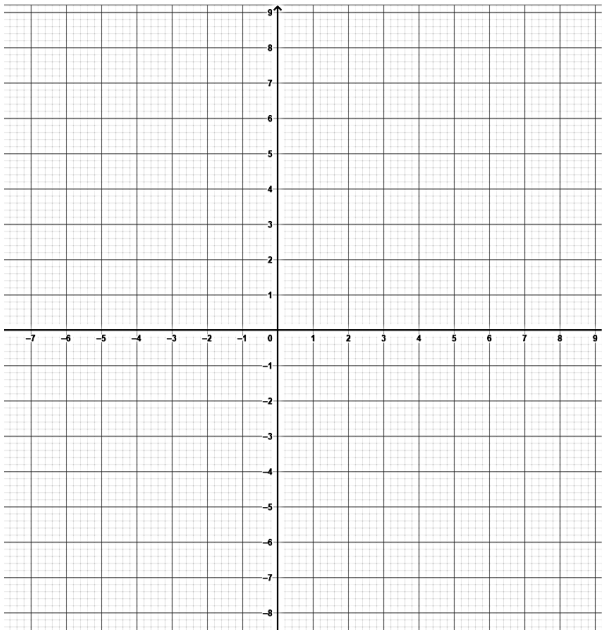
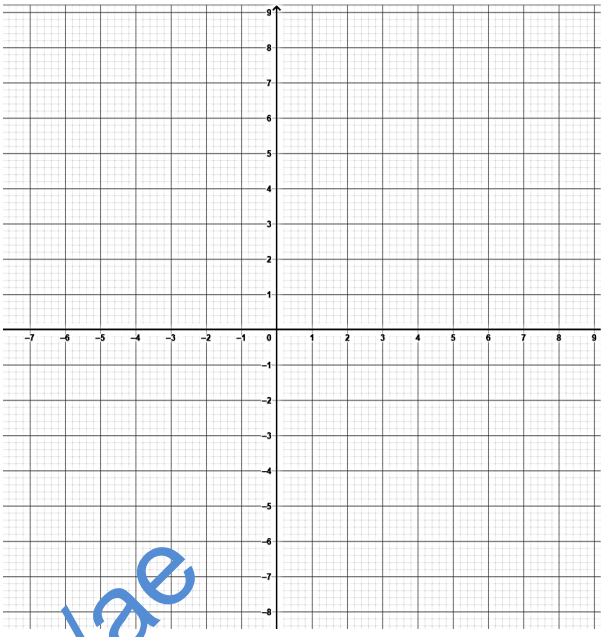


38. $g(x) = \sqrt{x-3} + 2$



39. $g(x) = -(x-6)^2 - 5$



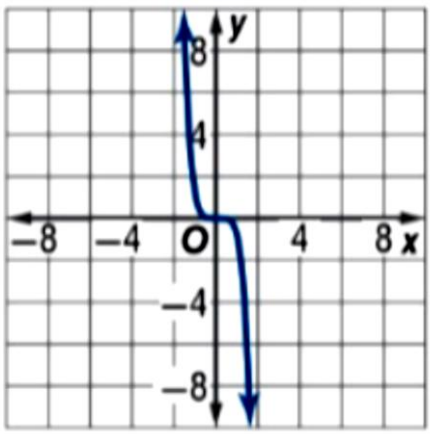
For each pair of functions, find $[f \circ g](x)$, $[g \circ f](x)$, and $[f \circ g](2)$.

48. $f(x) = 4x - 11; g(x) = 2x^2 - 8$

Determine whether the given relation represents *y* as a function of *x*.

1. $x = y^2 - 5$

2.



3. $y = \sqrt{x^2 + 3}$

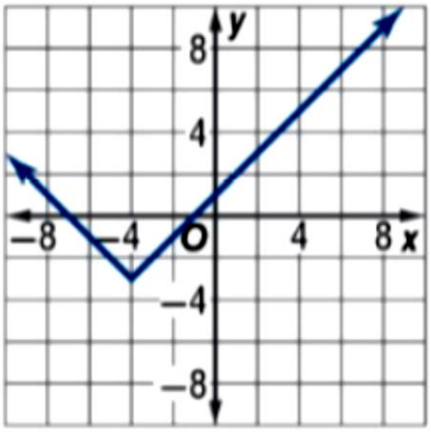
4. PARKING The cost of parking a car downtown is AED 0.75 per 30 minutes for a maximum of AED 4.50. Parking is charged per second.

a. Write a function for $c(x)$, the cost of parking a car for x hours.

b. Find $c(2.5)$..

State the domain and range of each function.

5.



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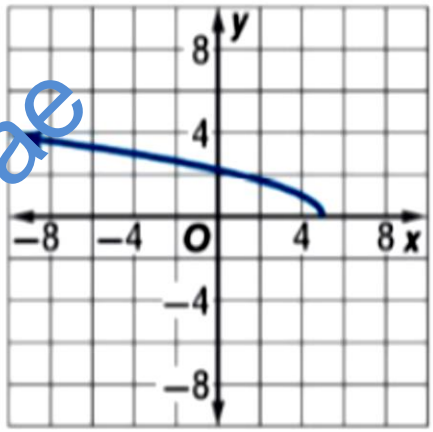


Find the y-intercept(s) and zeros for each function.

7. $f(x) = 4x^2 - 8x - 12$

8. $f(x) = x^3 + 4x^2 + 3x$

9. MULTIPLE CHOICE Which relation is symmetric with respect to the x-axis?

A $-x^2 - yx = 2$

B $x^3y = 8$

C $y = |x|$

D $-y^2 = -4x$

Determine whether each function is continuous at $x = 3$. If discontinuous, identify the type of discontinuity as *infinite*, *jump*, or *removable*.

10. $f(x) = \begin{cases} 2x & \text{if } x < 3 \\ 9 - x & \text{if } x \geq 3 \end{cases}$

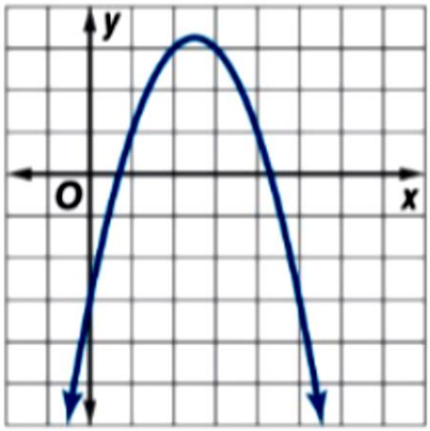
11. $f(x) = \dfrac{x - 3}{x^2 - 9}$

Find the average rate of change for each function on the interval $[-2, 6]$.

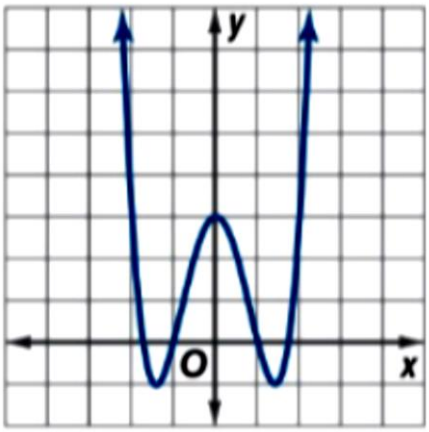
12. $f(x) = -x^4 + 3x$

Use the graph of each function to estimate intervals to the nearest 0.5 unit on which the function is increasing or decreasing.

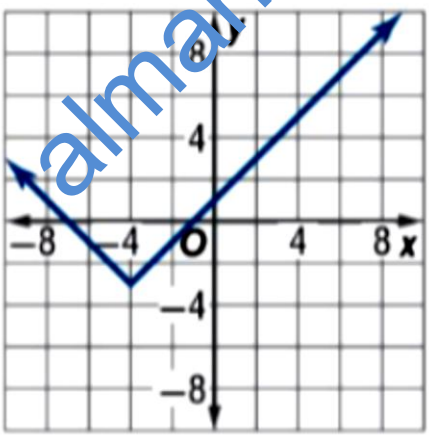
14.



15.



16. **MULTIPLE CHOICE** Which function is shown in the graph?



F $f(x) = |x - 4| - 3$

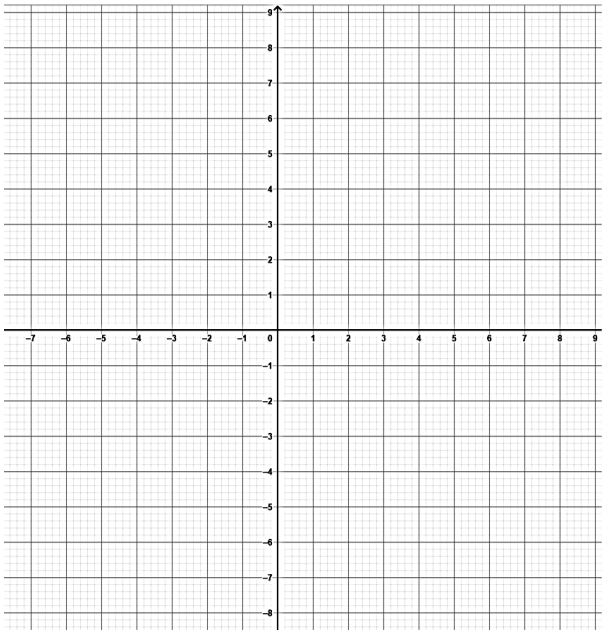
G $f(x) = |x - 4| + 3$

H $f(x) = |x + 4| - 3$

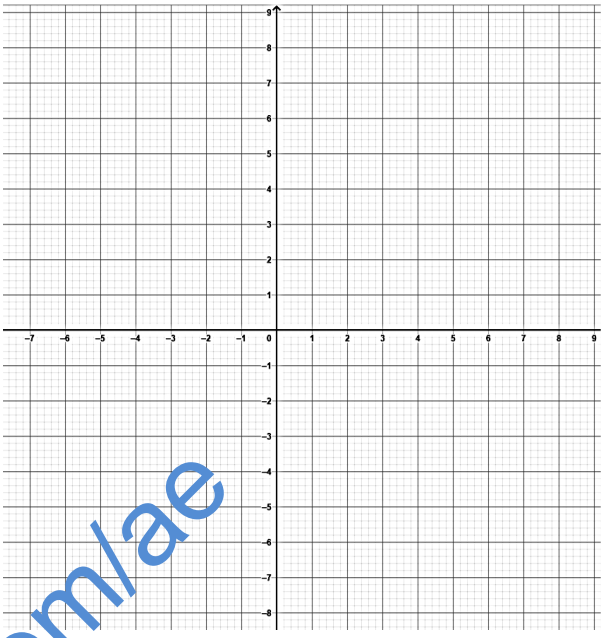
J $f(x) = |x + 4| + 3$

Identify the parent function $f(x)$ of $g(x)$. Then sketch the graph of $g(x)$.

17. $g(x) = -(x + 3)^3$



18. $g(x) = |x^2 - 4|$



Given $f(x) = x - 6$ and $g(x) = x^2 - 36$, find each function and its domain.

19. $\left(\frac{f}{g}\right)(x)$

20. $[g \circ f](x)$

21. **TEMPERATURE** In most countries, temperature is measured in degrees Celsius. The equation that relates degrees Fahrenheit with degrees Celsius is $F = \frac{9}{5}C + 32$.

a. Write C as a function of F.

b. Find two functions f and g such that $C = [f \circ g](F)$.

Determine whether f has an inverse function. If it does, find the inverse function and state any restrictions on its domain.

22. $f(x) = (x - 2)^3$

23. $f(x) = \dfrac{x + 3}{x - 8}$

24. $f(x) = \sqrt{4 - x}$

25. $f(x) = x^2 - 16$

Graph and analyze each function. Describe the domain, range, intercepts, end behavior, continuity, and where the function is increasing or decreasing.

$f(x) = 5x^6$

$f(x) = -8x^3$

$f(x) = x^{-9}$

$f(x) = \frac{1}{3}x^{-4}$

$f(x) = -4x^{-5}$.

Solve each equation.

$2x = 4 + \sqrt{7x - 12}$

$\sqrt{4x + 5} + 1 = 4x$

$\sqrt[4]{x^2 + 31} - 1 = 3$

Describe the end behavior of the graph of each polynomial function using limits. Explain your reasoning using the leading term test.

$f(x) = -4x^4 + 7x^3 - 8x^2 + 12x - 6$

$f(x) = -3x^5 + 7x^4 + 3x^3 - 11x - 5$

$f(x) = \frac{2}{3}x^2 - 8x - 3$

$f(x) = x^3(x - 5)(x + 7)$

State the number of possible real zeros and turning points of each function. Then determine all of the real zeros by factoring.

$f(x) = x^3 - 7x^2 + 12x$

$f(x) = x^5 + 8x^4 - 20x^3$

$f(x) = x^4 - 10x^2 + 9$

$f(x) = x^4 - 25$

For each function, (a) apply the leading term test, (b) find the zeros and state the multiplicity of any repeated zeros, (c) find a few additional points, and then (d) graph the function.

$f(x) = x^3(x - 3)(x + 4)^2$

$f(x) = (x - 5)^2(x - 1)^2$

Divide using long division.

$(x^3 + 8x^2 - 5) \div (x - 2)$

Divide using synthetic division.

$(x^3 - 8x^2 + 7x - 15) \div (x - 1)$

$(x^4 - x^3 + 7x^2 - 9x - 18) \div (x - 2)$

$(2x^4 + 3x^3 - 10x^2 + 16x - 6) \div (2x - 1)$

Use the Factor Theorem to determine if the binomials given are factors of $f(x)$. Use the binomials that are factors to write a factored form of $f(x)$.

$f(x) = x^3 + 3x^2 - 8x - 24; (x + 3)$

$f(x) = 2x^4 - 9x^3 + 2x^2 + 9x - 4; (x - 1), (x + 1)$

$f(x) = x^4 - 2x^3 - 3x^2 + 4x + 4; (x + 1), (x - 2)$

List all possible rational zeros of each function.
Then determine which, if any, are zeros.

$f(x) = x^3 - 14x - 15$

$f(x) = x^4 + 5x^2 + 4$

$f(x) = 3x^4 - 14x^3 - 2x^2 + 31x + 10$

Solve each equation.

$x^4 - 9x^3 + 29x^2 - 39x + 18 = 0$

Use the given zero to find all complex zeros of each function. Then write the linear factorization of the function.

$f(x) = x^4 + x^3 - 41x^2 + x - 42; i$

Solve each equation.

3. $x = \sqrt{4 - x} - 8$

$-2 + \sqrt{3x + 2} = x$

$x^4 - 5x^3 - 14x^2 = 0$

$x^3 - 3x^2 - 10x = -24$

Describe the end behavior of the graph of each polynomial function using limits. Explain your reasoning using the leading term test.

9. $f(x) = 5x^4 - 3x^3 - 7x^2 + 11x - 8$

10. $f(x) = -3x^5 - 8x^4 + 7x^2 + 5$

State the number of possible real zeros and turning points of each function. Then find all of the real zeros by factoring.

$f(x) = 4x^3 + 8x^2 - 60x$

12. $f(x) = x^5 - 16x$

MULTIPLE CHOICE Which function has 3 turning points?

A $f(x) = x^4 - 4$

B $f(x) = x^4 - 11x^3$

C $f(x) = x^3 + 9x^2 + 20x$

D $f(x) = x^4 - 5x^2 + 4$

For each function, (a) apply the leading term test, (b) find the zeros and state the multiplicity of any repeated zeros, (c) find a few additional points, and then (d) graph the function.

15. $f(x) = x(x - 1)(x + 3)$

16. $f(x) = x^4 - 9x^2$

Use the Factor Theorem to determine if the binomials given are factors of $f(x)$. Use the binomials that are factors to write a factored form of $f(x)$.

$f(x) = x^3 - 3x^2 - 13x + 15$; $(x + 3)$

$f(x) = x^4 - x^3 - 34x^2 + 4x + 120; (x + 5), (x - 2)$

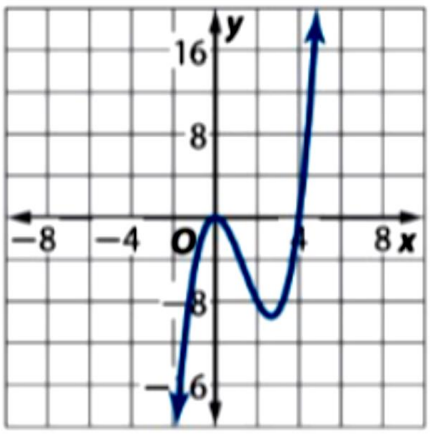
Write a polynomial function of least degree with real coefficients in standard form that has the given zeros.

$5, -5, 1 - i$

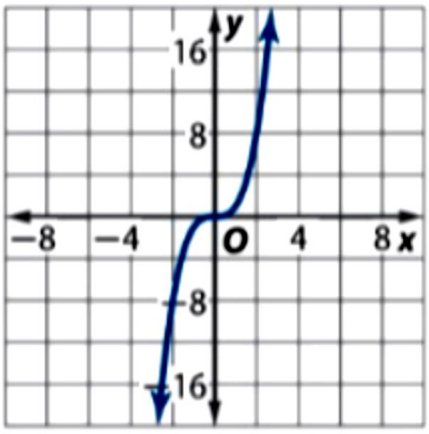
$-1, 4, -\sqrt{3}, \sqrt{3}$

MULTIPLE CHOICE Which function graphed below must have imaginary zeros?

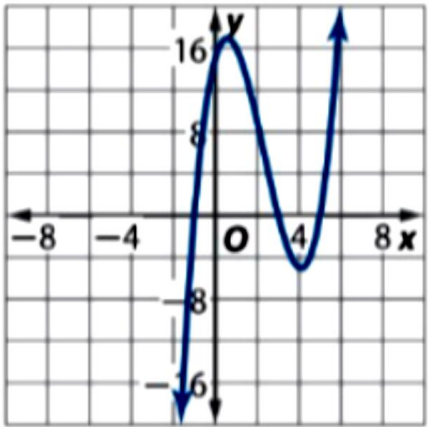
F



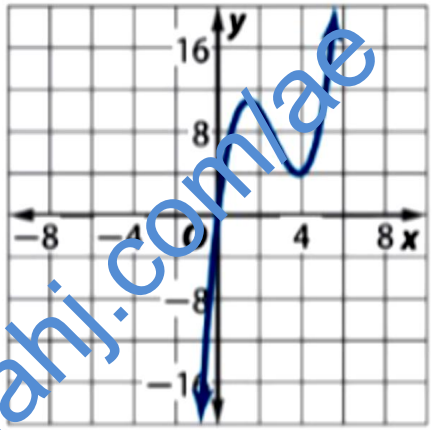
H



G



J



Divide using synthetic division.

$f(x) = (x^3 - 7x^2 + 13) \div (x - 2)$

$f(x) = (x^4 + x^3 - 2x^2 + 3x + 8) \div (x + 3)$

Determine any asymptotes and intercepts. Then graph the function and state its domain.

$$f(x) = \frac{2x - 6}{x + 5}$$

Solve each inequality.

$$x^2 - 5x - 14 < 0$$

$$\frac{x^2}{x - 6} \geq 0$$

Evaluate each expression.

$\log_3 \frac{1}{81}$

$\log_{32} 2$

$\log_2 32$

$\ln e^{11}$

$\log_{13} 1$

$\log 10^{12}$

$9^{\log_9 5.3}$

$\log_{25} 5$

$3^{\log_3 9}$

$\log 80$

What is the value of AED 2000 invested at 6.5% after 12 years if the interest is compounded quarterly? continuously?

FINANCIAL LITERACY You invest AED 1500 in an account with an interest rate of 8% for 12 years, making no other deposits or withdrawals.

a. What will be your account balance if the interest is compounded monthly?

b. What will be your account balance if the interest is compounded continuously?

Expand each expression.

$\log_6 36xy^2$

$\log_3 \frac{a\sqrt{b}}{12}$

$\log_3 9x^3y^3z^6$

$\log_5 x^2a^7\sqrt{b}$

$\ln \frac{e}{x^2y^3z}$

Condense each expression.

$3 \log_3 x - 2 \log_3 y$

$\frac{1}{3} \log_2 a + \log_2 (b + 1)$

$5 \ln (x + 3) + 3 \ln 2x - 4 \ln (x - 1)$

$2 \log_4 m + 6 \log_4 n$

$1 + \ln 3 - 4 \ln x$

Solve each equation.

$3^{x+8} = 9^{2x}$

$e^{2x} - 3e^{x} + 2 = 0$

$\log x + \log (x - 3) = 1$

$\log_2 (x - 1) + 1 = \log_2 (x + 3)$

$3^{x+3} = 27^{x-2}$

$25^{3x+2} = 125$

$e^{2x} - 8e^x + 15 = 0$

$\log_2 x + \log_2 3 = \log_2 18$

$\log_6 x + \log_6 (x - 5) = 2$

MULTIPLE CHOICE Which equation has no solution?

F $e^x = e^{-x}$

G $2^{x-1} = 3^{x+1}$

H $\log_5 x = \log_9 x$

J $\log_2 (x + 1) = \log_2 x$

MULTIPLE CHOICE For which function is $\lim_{x \to \infty} f(x) = -\infty$?

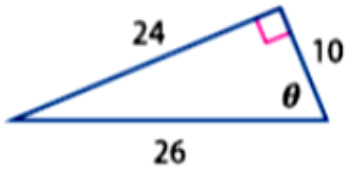
A $f(x) = -2 \cdot 3^{-x}$

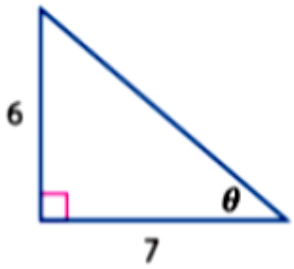
B $f(x) = -\left(\frac{1}{10}\right)^x$

C $f(x) = -\log_8 (x - 5)$

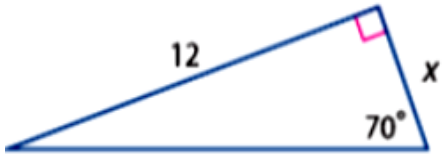
D $f(x) = \log_3 (-x) - 6$

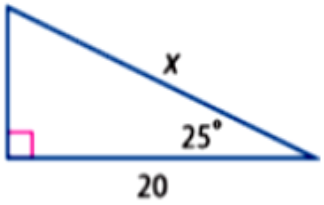
Find the exact values of the six trigonometric functions of θ.



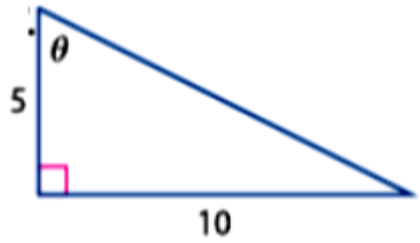


Find the value of x. Round to the nearest tenth if necessary.





Find the measure of angle θ. Round to the nearest degree if necessary.

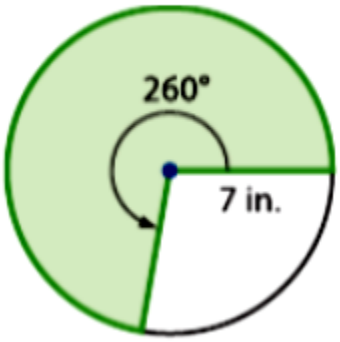


Write $\frac{2\pi}{9}$ in degrees.

Identify all angles that are coterminal with the given angle. Then find and draw one positive and one negative angle coterminal with the given angle.

$\frac{3\pi}{10}$ $-22°$

MULTIPLE CHOICE Find the approximate area of the shaded region.



A $12.2\ \text{in}^2$

B $42.8\ \text{in}^2$

C $85.5\ \text{in}^2$

D $111.2\ \text{in}^2$

Find the exact values of the five remaining trigonometric functions of θ.

$\cos\theta = -\frac{2}{5}$, where $\sin\theta < 0$ and $\tan\theta > 0$

State the amplitude, period, frequency, phase shift, and vertical shift of each function.

$y = -3\sin\left(x - \frac{3\pi}{2}\right)$ $y = 5\cos 2x - 2$

MULTIPLE CHOICE Which of the functions has the same graph as $y = 3 \sin (x - \pi)$?

F $y = 3 \sin (x + \pi)$

H $y = -3 \sin (x - \pi)$

G $y = 3 \cos \left(x - \frac{\pi}{2}\right)$

J $y = -3 \cos \left(x + \frac{\pi}{2}\right)$

MULTIPLE CHOICE What is the linear speed of a point rotating at an angular speed of 36 radians per second at a distance of 12 centimeters from the center of the rotation?

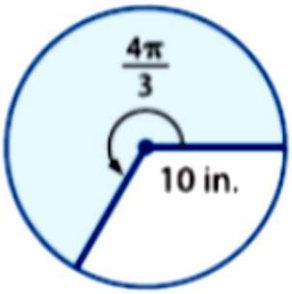
A 420 cm./s

C 439 cm./s

B 432 cm./s

D 444 cm./s

Find the area of the sector of the circle shown.



MULTIPLE CHOICE An angle θ satisfies the following inequalities: $\csc \theta < 0$, $\cot \theta > 0$, and $\sec \theta < 0$. In which quadrant does θ lie?

F I **H** III

G II **J** IV

Locate the vertical asymptotes, and sketch the graph of each function.

$y = \tan\left(x + \frac{\pi}{4}\right)$ $y = \frac{1}{2}\sec 2x$

Find the exact value of each expression, if it exists.

$\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$ $\sin^{-1}\left(-\frac{1}{2}\right)$

Find the value of each expression using the given information.

1. $\sin \theta$ and $\cos \theta$, $\csc \theta = -4$, $\cos \theta < 0$

Simplify each expression.

$$\frac{\sin(90^\circ - x)}{\tan(90^\circ - x)}$$

$$\frac{\sec^2 x - 1}{\tan^2 x + 1}$$

$$\sin\theta\,(1 + \cot^2\theta)$$

Verify each identity.

$$\frac{\cos\theta}{1+\sin\theta} + \frac{1-\sin\theta}{\cos\theta} = \frac{2\cos\theta}{1+\sin\theta}$$

$$\frac{1}{1+\cos\theta} + \frac{1}{1-\cos\theta} = 2\csc^2\theta$$

MULTIPLE CHOICE Which expression is *not* true?

A $\tan(-\theta) = -\tan\theta$

B $\tan(-\theta) = \dfrac{1}{\cot(-\theta)}$

C $\tan(-\theta) = \dfrac{\sin(-\theta)}{\cos(-\theta)}$

D $\tan(-\theta) + 1 = \sec(-\theta)$

Find all solutions of each equation on the interval $[0, 2\pi]$.

$\sqrt{2}\sin\theta + 1 = 0$

Solve each equation for all values of θ.

$\dfrac{1 - \sin\theta}{\cos\theta} = \cos\theta$

Find the exact value of each trigonometric expression.

tan 165°

sin 75°

$\cos -\frac{\pi}{12}$

MULTIPLE CHOICE Which identity is true?

F $\cos(\theta + \pi) = -\sin \pi$

G $\cos(\pi - \theta) = \cos \theta$

H $\sin\left(\theta - \frac{3\pi}{2}\right) = \cos \theta$

J $\sin(\pi + \theta) = \sin \theta$

Simplify each expression.

$$\cos\frac{\pi}{8}\cos\frac{3\pi}{8} - \sin\frac{\pi}{8}\sin\frac{3\pi}{8}$$

$$\frac{\tan 135^\circ - \tan 15^\circ}{1 + \tan 135^\circ \tan 15^\circ}$$

Find the values of sin 2θ, cos 2θ, and tan 2θ for the given value and interval.

$$\cos\theta = \frac{5}{9}, \left(0, \frac{\pi}{2}\right)$$