

1. Solve the equation.

$$8x^3 + x^2 - 72x - 9 = 0$$

The solution set is { }.

(Simplify your answer. Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

Answer:  $-\frac{1}{8}, -3, 3$

ID: PF.4.39

*Use synthetic division*

$$\begin{array}{r|rrrr} 3 & 8 & 1 & -72 & -9 \\ & & 24 & 75 & -9 \\ \hline & 8 & 25 & 3 & 0 \text{ rem} \end{array}$$

*Use synthetic division*

$$\begin{array}{r|rrrr} -3 & 8 & 25 & 3 & \\ & & -24 & -3 & \\ \hline & 8 & 1 & 0 & \text{rem} \end{array}$$

$8x + 1 = 0$   
 $8x + 1 - 1 = 0 - 1$

*Possible List =  $\frac{\pm 9}{\pm 8}$*   
*First =  $\frac{\pm 9}{\pm 8}$*

$\frac{\pm 9, \pm 3, \pm 1}{\pm 8, \pm 4, \pm 2, \pm 1}$

$8x = -1$   
 $\frac{8x}{8} = \frac{-1}{8}$   
 $x = -\frac{1}{8}$

$3, -3, -\frac{1}{8}$

*Good*  
*Good*  
*Good*

2. Find the distance  $d(P_1, P_2)$  between the given points  $P_1$  and  $P_2$ .

$P_1 = (2, 5)$   
 $P_2 = (-1, 6)$

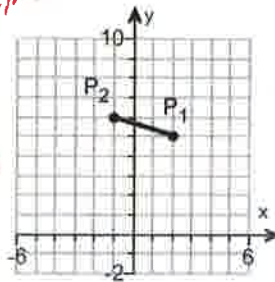
*formula*

$$d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

$$d = \sqrt{(2 - (-1))^2 + (5 - 6)^2}$$

$$d = \sqrt{(2 + 1)^2 + (5 - 6)^2}$$

$$d = \sqrt{(3)^2 + (-1)^2}$$



$(2, 5)$   $(-1, 6)$   
 $x_1 \ y_1$   $x_2 \ y_2$

$d(P_1, P_2) =$  \_\_\_\_\_  
 (Simplify your answer. Type an exact answer, using radicals as needed.)

Answer:  $\sqrt{10}$

$d = \sqrt{9 + 1}$   
 $d = \sqrt{10}$  OR  $d = 3.16227766$  OR  $d = 3.16$

ID: F.1.21

3. Find the midpoint of the line segment joining the points  $P_1$  and  $P_2$ .

$P_1 = (2, -5); P_2 = (4, 9)$

*midpoint =  $(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2})$*

$(2, -5)$   $(4, 9)$   
 $x_1 \ y_1$   $x_2 \ y_2$

The midpoint of the line segment joining the points  $P_1$  and  $P_2$  is \_\_\_\_\_  
 (Simplify your answer. Type an ordered pair.)

Answer:  $(3, 2)$

*mid point =  $(\frac{(2)+(4)}{2}, \frac{(-5)+(9)}{2})$*

*mid point =  $(\frac{2+4}{2}, \frac{-5+9}{2})$*

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*mid point =  $(\frac{6}{2}, \frac{4}{2})$*

*mid point =  $(3, 2)$*

4.

For the equation  $x^2 + y^2 - 4x - 8y - 16 = 0$ , do the following.

- (a) Find the center (h,k) and radius r of the circle.
- (b) Graph the circle.
- (c) Find the intercepts, if any.

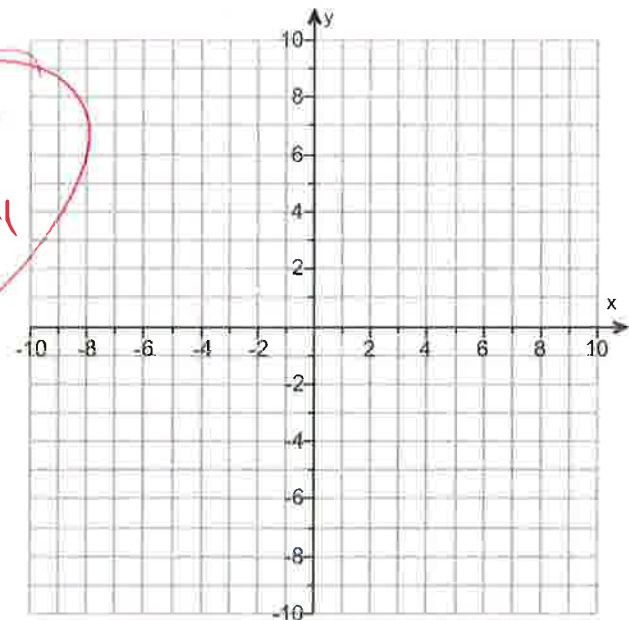
(a) The center is \_\_\_\_\_.  
(Type an ordered pair.)

The radius is r = \_\_\_\_\_.

(b) Use the graphing tool to graph the circle.

(c) Find the intercepts, if any. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The intercept(s) is/are \_\_\_\_\_.  
(Type an ordered pair. Use a comma to separate answers as needed. Type exact answers for each coordinate, using radicals as needed.)
- B. There is no intercept.



Complete the square

$x^2 + y^2 - 4x - 8y - 16 = 0$   
 $x^2 - 4x + y^2 - 8y = 16$  rewrite

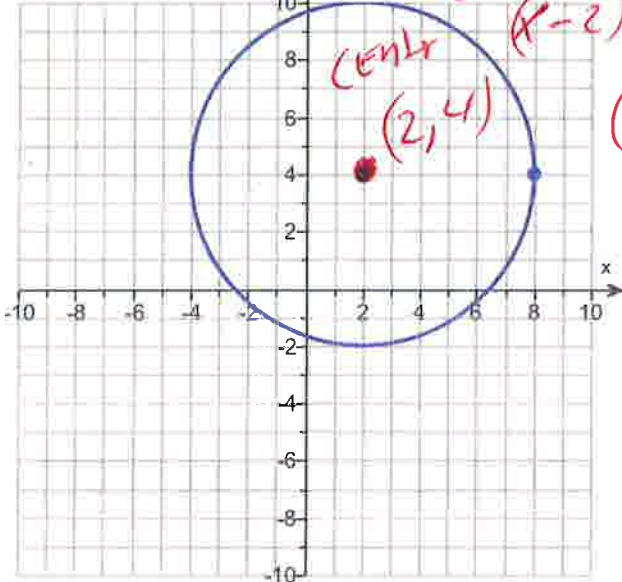
$x^2 - 4x + (\frac{1}{2}(-4))^2 + y^2 - 8y + (\frac{1}{2}(-8))^2 = 16 + (\frac{1}{2}(-4))^2 + (\frac{1}{2}(-8))^2$

Answers (2,4)

6

$x^2 - 4x + (-2)^2 + y^2 - 8y + (-4)^2 = 16 + (-2)^2 + (-4)^2$

$x^2 - 4x + 4 + y^2 - 8y + 16 = 16 + 4 + 16$



$(x-2)(x-2) + (y-4)(y-4) = 36$   
 $(x-2)^2 + (y-4)^2 = 36$   
 CENTER = (2, 4) ✓

Radius =  $\sqrt{36} = 6$  ✓✓✓

A. The intercept(s) is/are  $(2 - 2\sqrt{5}, 0), (2 + 2\sqrt{5}, 0), (0, 4 - 4\sqrt{2}), (0, 4 + 4\sqrt{2})$ .

(Type an ordered pair. Use a comma to separate answers as needed. Type exact answers for each coordinate, using radicals as needed.)

ID: F.4.27

5. Find the domain of the function.

$$f(x) = \sqrt{2x - 10}$$

The domain is \_\_\_\_\_ . (Type your answer in interval notation.)

Answer:  $[5, \infty)$

ID: 1.1.59

formula  
domain

$$f(x) = \sqrt{Ax + B}$$

$$\text{set } Ax + B \geq 0$$

$$f(x) = \sqrt{2x - 10}$$

$$\text{set } 2x - 10 \geq 0$$

$$2x - 10 + 10 \geq 0 + 10$$

$$2x \geq 10$$

$$\frac{2x}{2} \geq \frac{10}{2}$$

$$x \geq 5$$



$$[5, \infty)$$

6. For the given functions  $f$  and  $g$ , complete parts (a)-(h). For parts (a)-(d), also find the domain.

$f(x) = 5x + 1; g(x) = 3x - 4$

(a) Find  $(f + g)(x)$ .

$(f + g)(x) =$  \_\_\_\_\_ (Simplify your answer.)

$(f+g)(x) =$   
 $(5x+1) + (3x-4) =$   
 $5x+1+3x-4 =$   
 $8x-3 =$

Domain  
 $(-\infty, \infty)$

What is the domain of  $f + g$ ? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The domain is  $\{x |$  \_\_\_\_\_  $\}$ .  
(Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

B. The domain is  $\{x | x$  is any real number  $\}$ .

$(f-g)(x) =$   
 $f(x) - g(x) =$   
 $(5x+1) - (3x-4) =$   
 $5x+1-3x+4 =$   
 $2x+5 =$

Domain  
 $(-\infty, \infty)$

(b) Find  $(f - g)(x)$ .

$(f - g)(x) =$  \_\_\_\_\_ (Simplify your answer.)

What is the domain of  $f - g$ ? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The domain is  $\{x |$  \_\_\_\_\_  $\}$ .  
(Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

B. The domain is  $\{x | x$  is any real number  $\}$ .

$(f \cdot g)(x) =$   
 $f(x) \cdot g(x) =$   
 $(5x+1)(3x-4) =$   
 $15x^2 - 20x + 3x - 4 =$   
 $15x^2 - 17x - 4 =$

Domain  
 $(-\infty, \infty)$

(c) Find  $(f \cdot g)(x)$ .

$(f \cdot g)(x) =$  \_\_\_\_\_ (Simplify your answer.)

What is the domain of  $f \cdot g$ ? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The domain is  $\{x |$  \_\_\_\_\_  $\}$ .  
(Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

B. The domain is  $\{x | x$  is any real number  $\}$ .

$(\frac{f}{g})(x) =$

$\frac{f(x)}{g(x)} =$  set  $3x-4=0$   
 $3x-4+4=0+4$   
 $3x=4$   
 $\frac{3x}{3} = \frac{4}{3}$

(d) Find  $(\frac{f}{g})(x)$ .

$(\frac{f}{g})(x) =$  \_\_\_\_\_ (Simplify your answer.)

$\frac{5x+1}{3x-4} =$

Domain  $x \neq \frac{4}{3}$

What is the domain of  $\frac{f}{g}$ ? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The domain is  $\{x |$  \_\_\_\_\_  $\}$ .  
(Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

B. The domain is  $\{x | x$  is any real number  $\}$ .

$(f+g)(x) = 8x-3$   
 $(f+g)(4) = 8(4)-3$   
 $(f+g)(4) = 32-3$   
 $(f+g)(4) = 29$

(e) Find  $(f + g)(4)$ .

$(f + g)(4) =$  \_\_\_\_\_ (Type an integer or a simplified fraction.)

$(f - g)(x) = 2x + 5$   
 $(f - g)(2) = 2(2) + 5$

(f) Find  $(f - g)(2)$ .

$(f - g)(2) =$  \_\_\_\_\_ (Type an integer or a simplified fraction.)

$(f - g)(2) = 8 + 5$   
 $(f - g)(2) = 13$  ✓✓

(g) Find  $(f \cdot g)(3)$ .

$(f \cdot g)(3) =$  \_\_\_\_\_ (Type an integer or a simplified fraction.)

$(f \cdot g)(x) = 15x^2 - 17x - 4$

(h) Find  $\left(\frac{f}{g}\right)(1)$ .

$\left(\frac{f}{g}\right)(1) =$  \_\_\_\_\_ (Type an integer or a simplified fraction.)

$(f \cdot g)(3) = 15(3)^2 - 17(3) - 4$   
 $(f \cdot g)(3) = 15(3)(3) - 17(3) - 4$

Answers 8x - 3

B. The domain is  $\{x \mid x \text{ is any real number}\}$ .

$2x + 5$

B. The domain is  $\{x \mid x \text{ is any real number}\}$ .

$15x^2 - 17x - 4$

B. The domain is  $\{x \mid x \text{ is any real number}\}$ .

$\frac{5x + 1}{3x - 4}$

$\left(\frac{f}{g}\right)(x) = \frac{5x + 1}{3x - 4}$

A. The domain is  $\left\{x \mid \underline{x \neq \frac{4}{3}}\right\}$ .

(Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

29

9

80

-6

$\left(\frac{f}{g}\right)(1) = \frac{5(1) + 1}{3(1) - 4}$

$\left(\frac{f}{g}\right)(1) = \frac{5 + 1}{3 - 4}$

$\left(\frac{f}{g}\right)(1) = \frac{6}{-1}$

$\left(\frac{f}{g}\right)(1) = -6$  ✓✓

ID: 1.1.67

7. Find the difference quotient of  $f$ ; that is, find  $\frac{f(x+h) - f(x)}{h}$ ,  $h \neq 0$ , for the following function. Be sure to simplify.

$$f(x) = x^2 - 8x + 9$$

$$\frac{f(x+h) - f(x)}{h} = \underline{\hspace{2cm}}$$

Answer:  $2x + h - 8$

ID: 1.1.83

$$f(x) = x^2 - 8x + 9$$

$$\frac{f(x+h) - f(x)}{h} =$$

$$\frac{(x+h)^2 - 8(x+h) + 9 - (x^2 - 8x + 9)}{h} =$$

$$\frac{(x+h)(x+h) - 8x - 8h + 9 - x^2 + 8x - 9}{h} =$$

$$\frac{x^2 + 1xh + 1xh + h^2 - 8x - 8h + 9 - x^2 + 8x - 9}{h} =$$

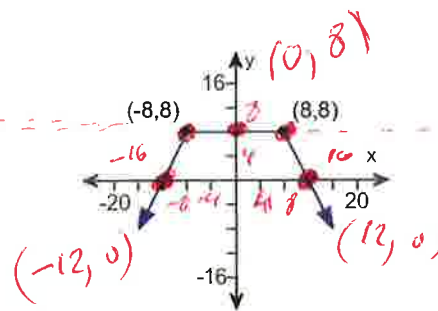
$$\frac{x^2 + 2xh + h^2 - \cancel{8x} - 8h + 9 - \cancel{x^2} + \cancel{8x} - 9}{h} =$$

$$\frac{2xh + h^2 - 8h}{h} =$$

$$\frac{2xh}{h} + \frac{h^2}{h} - \frac{8h}{h} = \checkmark\checkmark\checkmark$$

$$2x + h - 8 =$$

8. Determine whether the graph is that of a function by using the vertical-line test. If it is, use the graph to find
- its domain and range.
  - the intercepts, if any.
  - any symmetry with respect to the x-axis, y-axis, or the origin.



Is the graph that of a function?

- Yes  
 No

If the graph is that of a function, what are the domain and range of the function? Select the correct choice below and fill in any answer boxes within your choice.

- A. The domain is  $(-\infty, \infty)$ . The range is  $(-\infty, 8]$   
 (Type your answers in interval notation.)
- B. The graph is not a function.

What are the intercepts? Select the correct choice below and fill in any answer boxes within your choice.

- A.  $(-12, 0)$   $(12, 0)$   $(0, 8)$   
 (Type an ordered pair. Use a comma to separate answers as needed.)
- B. There are no intercepts.
- C. The graph is not a function.

Determine if the graph is symmetrical.

- A. It is symmetrical with respect to the y-axis.
- B. It is symmetrical with respect to the origin.
- C. It is symmetrical with respect to the x-axis.
- D. The graph is not symmetrical.
- E. The graph is not a function.

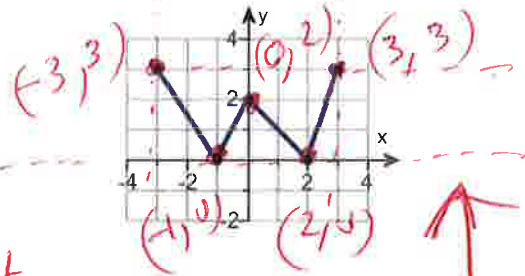
Answers Yes

- A. The domain is  $(-\infty, \infty)$ . The range is  $(-\infty, 8]$   
 (Type your answers in interval notation.)
- A.  $(12, 0), (-12, 0), (0, 8)$  (Type an ordered pair. Use a comma to separate answers as needed.)
- A. It is symmetrical with respect to the y-axis.

ID: 1.2.21

9. Using the given graph of the function  $f$ , find the following.

- (a) the intercepts, if any
- (b) its domain and range
- (c) the intervals on which it is increasing, decreasing, or constant
- (d) whether it is even, odd, or neither



(a) What are the intercepts?

$(-1, 0)$   $(2, 0)$   $(0, 2)$

(Simplify your answer. Type an ordered pair. Use a comma to separate answers as needed.)

(b) The domain is  $[-3, 3]$

The range is  $[0, 3]$

(c) On which interval(s) is the graph increasing? Select the correct choice below and fill in any answer boxes within your choice.

- A. The graph is increasing on  $[-1, 0]$   $[2, 3]$   
(Type your answer in interval notation. Use a comma to separate answers as needed.)
- B. The graph is not increasing on any interval.

On which interval(s) is the graph decreasing? Select the correct choice below and fill in any answer boxes within your choice.

- A. The graph is decreasing on  $[-3, -1]$   $[0, 2]$   
(Type your answer in interval notation. Use a comma to separate answers as needed.)
- B. The graph is not decreasing on any interval.

On which interval(s) is the graph constant? Select the correct choice below and fill in any answer boxes within your choice.

- A. The graph is constant on \_\_\_\_\_  
(Type your answer in interval notation. Use a comma to separate answers as needed.)
- B. The graph is not constant on any interval.

(d) The function is (1) \_\_\_\_\_

- (1)  odd.
- neither odd nor even.
- even.

*favorite hamburger place*  
*double meat*  
*double cheese*  
*double bacon*  
*with a diet soda*



Answers  $(-1,0),(2,0),(0,2)$

$[-3,3]$

$[0,3]$

A. The graph is increasing on  $[-1,0],[2,3]$ .

(Type your answer in interval notation. Use a comma to separate answers as needed.)

A. The graph is decreasing on  $[-3,-1],[0,2]$ .

(Type your answer in interval notation. Use a comma to separate answers as needed.)

B. The graph is not constant on any interval.

(1) neither odd nor even.

ID: 1.3.25

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10. The function  $f$  is defined as follows.

$$f(x) = \begin{cases} 4 + x & \text{if } x < 0 \\ x^2 & \text{if } x \geq 0 \end{cases}$$

- (a) Find the domain of the function.
- (b) Locate any intercepts.
- (c) Graph the function.
- (d) Based on the graph, find the range.

(a) The domain of the function  $f$  is  $(-\infty, \infty)$  ← (left, right)  
 (Type your answer in interval notation.)

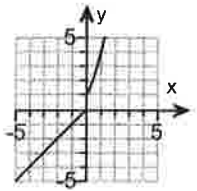
(b) Locate any intercepts. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The intercept(s) is/are  $(-4, 0), (0, 0)$  ←  $x$ -intercept also  $y$ -intercept  
 (Type an ordered pair. Use a comma to separate answers as needed.)

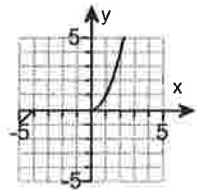
B. There are no intercepts.

(c) Choose the correct graph of  $f(x)$  below.

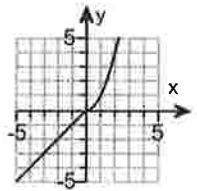
A.



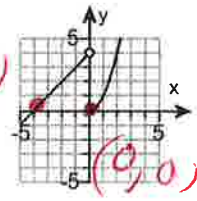
B.



C.



D.



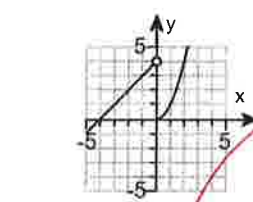
OPEN Circle  
 (-4, 0)  
 (0, 4)  
 (0, 0)

(d) The range of the function  $f$  is  $(-\infty, \infty)$  ← (bottom, top)  
 (Type your answer in interval notation.)

Answers  $(-\infty, \infty)$

A. The intercept(s) is/are  $(-4, 0), (0, 0)$   
 (Type an ordered pair. Use a comma to separate answers as needed.)

USE graphing calculator



D.  
 $(-\infty, \infty)$

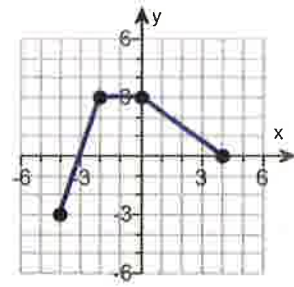
Windows  
 $x\text{-min} = -12$   
 $x\text{-max} = 12$   
 $y\text{-min} = -10$   
 $y\text{-max} = 10$

2ND Math

$y_1 = 4 + x$  (X < 0) ← 2ND Math close OPEN Circle  
 $y_2 = x^2$  (X ≥ 0) ← OPEN Circle

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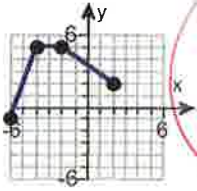
11. The graph of a function  $f$  is illustrated to the right. Use the graph of  $f$  as the first step toward graphing each of the following functions.



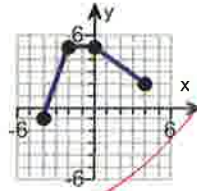
- (a)  $F(x) = f(x) + 2$
- (b)  $G(x) = f(x + 5)$
- (c)  $P(x) = -f(x)$
- (d)  $H(x) = f(x + 1) - 1$
- (e)  $Q(x) = \frac{1}{3}f(x)$
- (f)  $g(x) = f(-x)$
- (g)  $h(x) = f(2x)$

(a) Choose the correct graph of  $F(x) = f(x) + 2$  below.

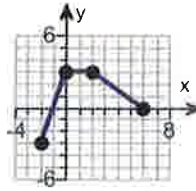
A.



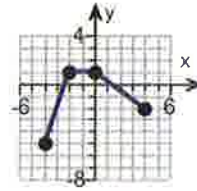
B.



C.

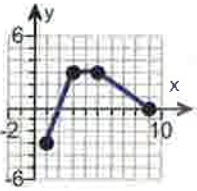


D.

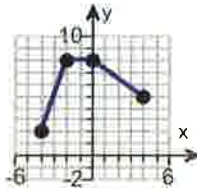


(b) Choose the correct graph of  $G(x) = f(x + 5)$  below.

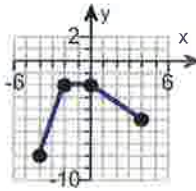
A.



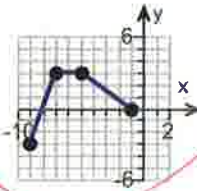
B.



C.

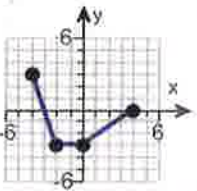


D.

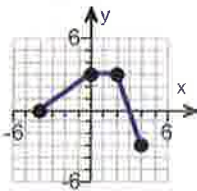


(c) Choose the correct graph of  $P(x) = -f(x)$  below.

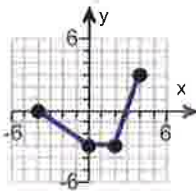
A.



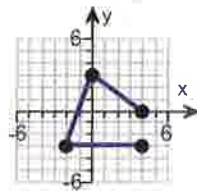
B.



C.

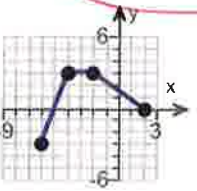


D.



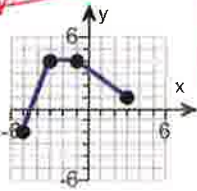
(d) Choose the correct graph of  $H(x) = f(x + 1) - 1$  below.

A.

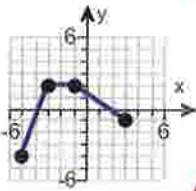


*Shift left -1*

B.

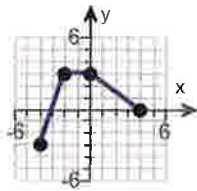


C.



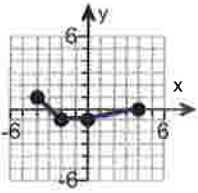
*Shift down -1*

D.

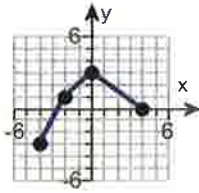


(e) Choose the correct graph of  $Q(x) = \frac{1}{3}f(x)$  below.

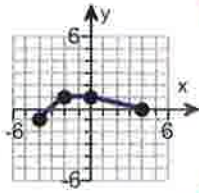
A.



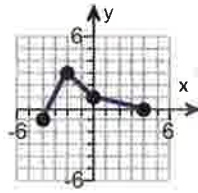
B.



C.

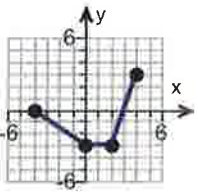


D.

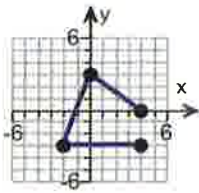


(f) Choose the correct graph of  $g(x) = f(-x)$  below.

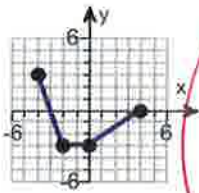
A.



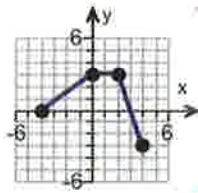
B.



C.

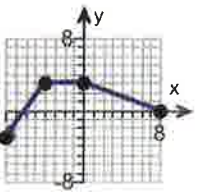


D.

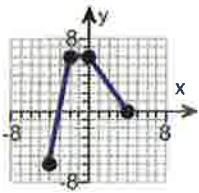


(g) Choose the correct graph of  $h(x) = f(2x)$  below.

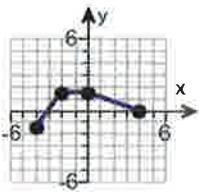
A.



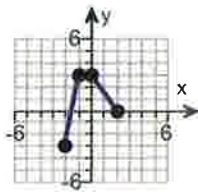
B.



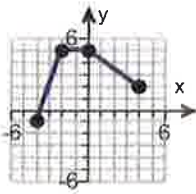
C.



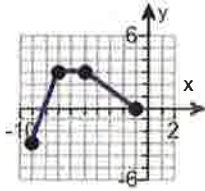
D.



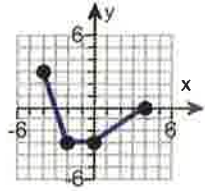
Answers



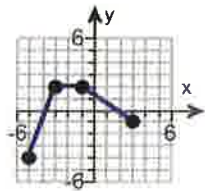
B.



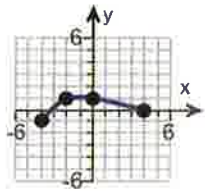
D.



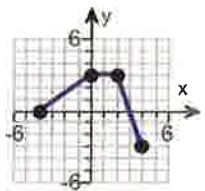
A.



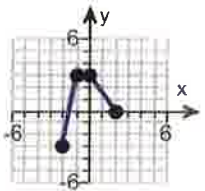
C.



C.



D.



D.

ID: 1.5.63

12.

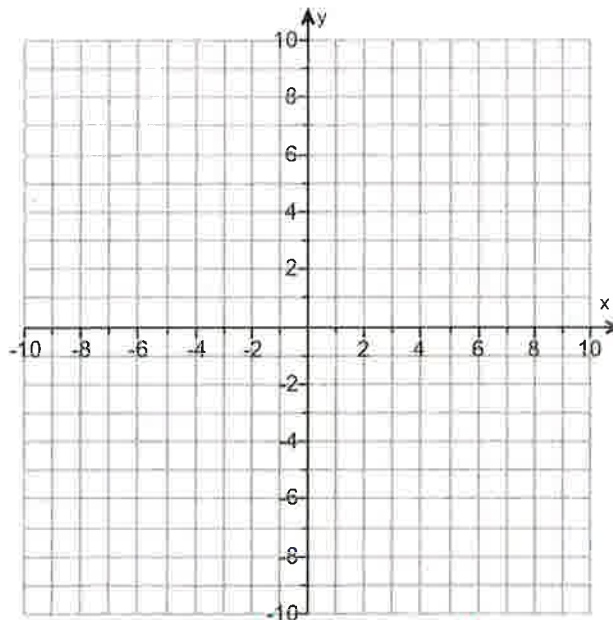
- (a) Graph  $f(x) = |x + 7| - 2$  using transformations.
- (b) Find the area of the region bounded by  $f$  and the x-axis that lies below the x-axis.

(a) Graph  $f(x)$ .

(Use the graphing tool provided to graph the function.)

(b) The area of the region bounded by  $f$  and the x-axis that lies below the x-axis is \_\_\_\_\_ square units.

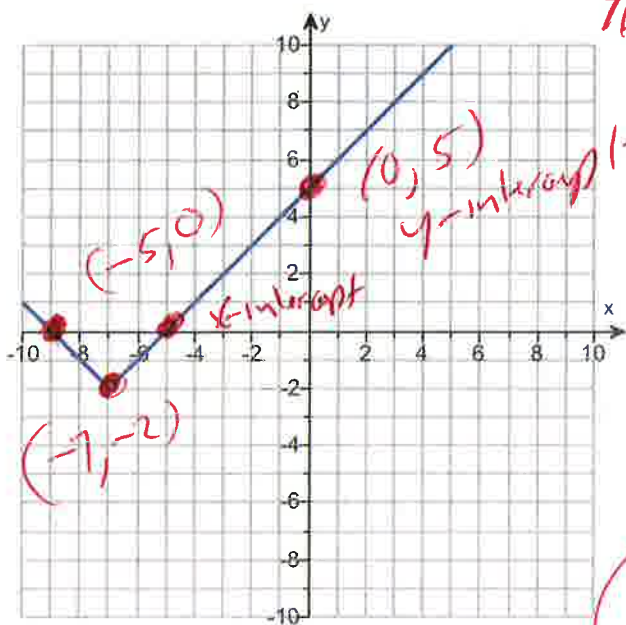
(Simplify your answer.)



Answers

$f(x) = |x + 7| - 2$

X-intercept  
 $(-9, 0)$



$x$	$f(x)$
-9	0
-7	-2
-5	0
0	5

use graphing calculator

4

ID: 1.5.81

Windows  
 $x$ -min = -12  
 $x$ -max = 12  
 $y$ -min = -10  
 $y$ -max = 10

$y_1 = \text{Math, Num, abs}$

$y_1 = \text{abs}(x + 7) - 2$   
 Shift left  $\rightarrow$   
 opp  
 Shift down  $\rightarrow$   
 $-2$

13. Find the zeros, if any, of the quadratic function using the quadratic formula. What are the x-intercepts, if any, of the graph of the function?

$f(x) = 8x^2 + 3 + 12x$

$f(x) = 8x^2 + 12x + 3$  *rewrite*

Select the correct choice below and, if necessary, fill in the answer box to complete your choice. (Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

- A. The zeros and the x-intercepts are the same. They are \_\_\_\_\_.
- B. The zeros and the x-intercepts are different. The zeros are \_\_\_\_\_, the x-intercepts are \_\_\_\_\_.
- C. There is no real zero solution and no x-intercept.

Answer: A. The zeros and the x-intercepts are the same. They are  $\frac{-3 + \sqrt{3}}{4}, \frac{-3 - \sqrt{3}}{4}$ .

ID: 2.3.47

$f(x) = 8x^2 + 12x + 3$   
 $a=8, b=12, c=3$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$  *Quadratic formula*

$x = \frac{-12 \pm \sqrt{(12)^2 - 4(8)(3)}}{2(8)}$

$x = \frac{-12 \pm \sqrt{144 - 96}}{16}$

$x = \frac{-12 \pm \sqrt{48}}{16}$

$x = \frac{-12 \pm \sqrt{16 \cdot 3}}{16}$

$x = \frac{-12 \pm \sqrt{16} \sqrt{3}}{16}$

$x = \frac{-12 \pm 4\sqrt{3}}{16}$

$x = \frac{4(-3 \pm 1\sqrt{3})}{4(4)}$

$x = \frac{-3 \pm 1\sqrt{3}}{4}$

$x = \frac{-3 \pm \sqrt{3}}{4}$

$x = \frac{-3 + \sqrt{3}}{4}$

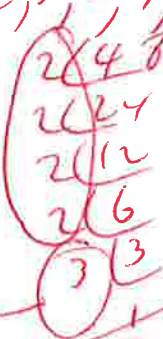
OR  
 $x = \frac{-3 - \sqrt{3}}{4}$

*rewrite*

Primes 2, 3, 5, 7, 11, 13...

$48 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 3$

$48 = 16 \cdot 3$



14  
WKT  
page



14

For the quadratic function  $f(x) = x^2 - 2x$ , answer parts (a) through (c).

(a) Graph the quadratic function by determining whether its graph opens up or down and by finding its vertex, axis of symmetry, y-intercept, and x-intercepts, if any.

Does the graph of  $f$  open up or down?

- up  
 down

What are the coordinates of the vertex?

The vertex of the parabola is \_\_\_\_\_.  
 (Type an ordered pair. Use integers or fractions for any numbers in the expression.)

What is the equation of the axis of symmetry?

The axis of symmetry is \_\_\_\_\_.  
 (Type an equation.)

What is/are the x-intercept(s)? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

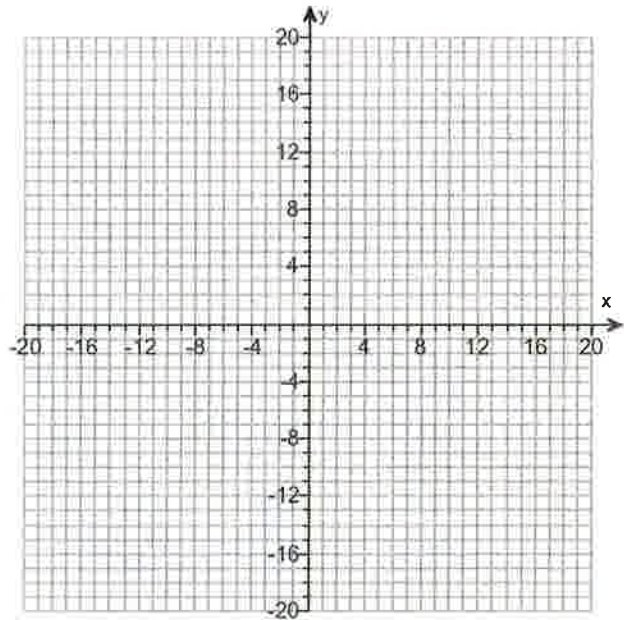
- A. The x-intercept(s) is/are \_\_\_\_\_.  
 (Type an integer or a decimal. Use a comma to separate answers as needed.)

- B. There are no x-intercepts.

What is the y-intercept? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The y-intercept is \_\_\_\_\_.  
 (Type an integer or a decimal.)
- B. There is no y-intercept.

Use the graphing tool to graph the function.



(b) Determine the domain and the range of the function.

The domain of  $f$  is \_\_\_\_\_.  
 (Type your answer in interval notation.)

The range of  $f$  is \_\_\_\_\_.  
 (Type your answer in interval notation.)

(c) Determine where the function is increasing and where it is decreasing.

Answers up

(1, -1)

x = 1

A. The x-intercept(s) is/are 0, 2

(Type an integer or a decimal. Use a comma to separate answers as needed.)

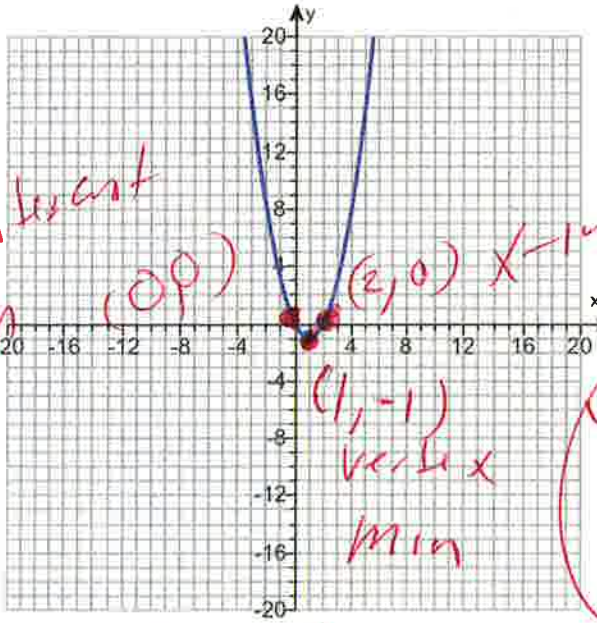
A. The y-intercept is 0. (Type an integer or a decimal.)

*Example swimming in the ocean at 238 am on Saturday night by your-self*

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

*Lucky Shades eat only in the day.*

x	f(x)
0	0
1	-1
2	0



*Both also x-intercept y-intercept*

*(0,0) x-intercept (2,0) x-intercept (1,-1) vertex min*

*you are the vertex*

$(-\infty, \infty)$

$[-1, \infty)$

$[1, \infty)$

$(-\infty, 1]$

*Windows*

*x-min = -12  
x-max = 12  
y-min = -10  
y-max = 10*

*USE graphing calculator*

ID: 2.4.33

$$y_1 = x^2 - 2x$$

*BIG*

15  
NFT  
please

15

For the quadratic function  $f(x) = x^2 - 2x - 8$ , answer parts (a) through (c).

(a) Graph the quadratic function by determining whether its graph opens up or down and by finding its vertex, axis of symmetry, y-intercept, and x-intercepts, if any.

Does the graph of  $f$  open up or down?

- down  
 up

What are the coordinates of the vertex?

The vertex of the parabola is \_\_\_\_\_.  
 (Type an ordered pair. Use integers or fractions for any numbers in the expression.)

What is the equation of the axis of symmetry?

The axis of symmetry is \_\_\_\_\_.  
 (Type an equation.)

What is/are the x-intercept(s)? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The x-intercept(s) is/are \_\_\_\_\_.  
 (Type an integer or a decimal. Use a comma to separate answers as needed.)

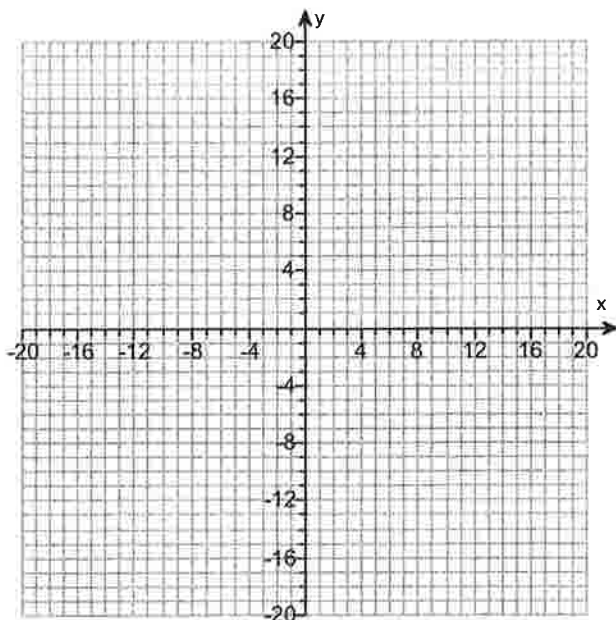
- B. There are no x-intercepts.

What is the y-intercept? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The y-intercept is \_\_\_\_\_.  
 (Type an integer or a decimal.)

- B. There is no y-intercept.

Use the graphing tool to graph the function.



(b) Determine the domain and the range of the function.

The domain of  $f$  is \_\_\_\_\_.  
 (Type your answer in interval notation.)

The range of  $f$  is \_\_\_\_\_.  
 (Type your answer in interval notation.)

(c) Determine where the function is increasing and where it is decreasing.

Answers up

(1, -9)

x = 1

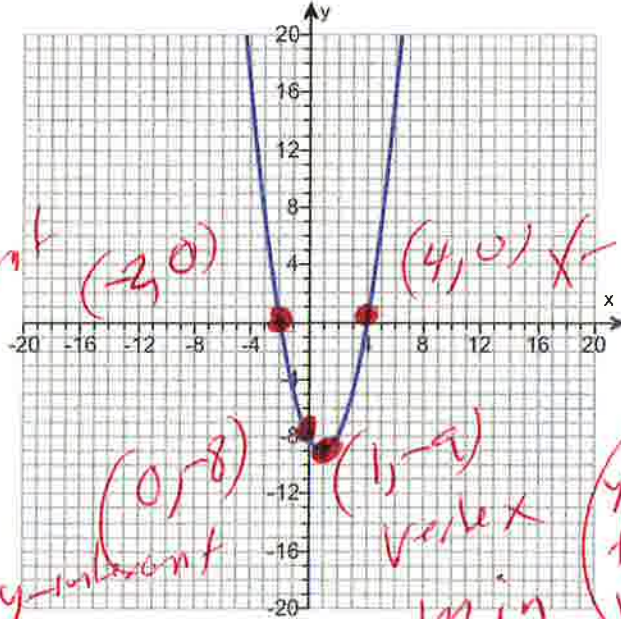
A. The x-intercept(s) is/are 4, -2.

(Type an integer or a decimal. Use a comma to separate answers as needed.)

A. The y-intercept is -8. (Type an integer or a decimal.)

$f(x) = x^2 - 2x - 8$

example  
Swimming in the sea at 3:34 am on Saturday night after eating a double meat double cheese double bacon hamburger by yourself.



x-intercept

x-intercept

x	f(x)
-2	0
0	-8
1	-9
4	0

you are the vertex

$(-\infty, \infty)$

$[-9, \infty)$

$[1, \infty)$

$(-\infty, 1]$

Windows

$x - \min = -12$   
 $x - \max = 12$

$y - \min = -10$   
 $y - \max = 10$

Use graphing calculator

ID: 2.4.37

Shades sleep at night always

$y = x^2 - 2x - 8$   
BIG                      BIG

~~16~~ NEXT Page

16  
For the quadratic function  $f(x) = -2x^2 + 2x - 4$ , answer parts (a) through (c). Verify the results using a graphing utility.

(a) Graph the quadratic function by determining whether its graph opens up or down and by finding its vertex, axis of symmetry, y-intercept, and x-intercepts, if any.

The graph of  $f$  opens (1) \_\_\_\_\_.

The vertex of  $f$  is \_\_\_\_\_.  
(Type an ordered pair.)

The axis of symmetry is \_\_\_\_\_.  
(Type an equation. Simplify your answer.)

Determine the y-intercept. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The y-intercept is \_\_\_\_\_.  
(Type an integer or a decimal.)

B. There is no y-intercept.

Determine the x-intercept(s). Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The x-intercept(s) is/are \_\_\_\_\_.  
(Type an integer or a decimal rounded to two decimal places as needed. Use a comma to separate answers as needed.)

B. There is no x-intercept.

Use the graphing tool to graph the function.

(b) Determine the domain and the range of the function.

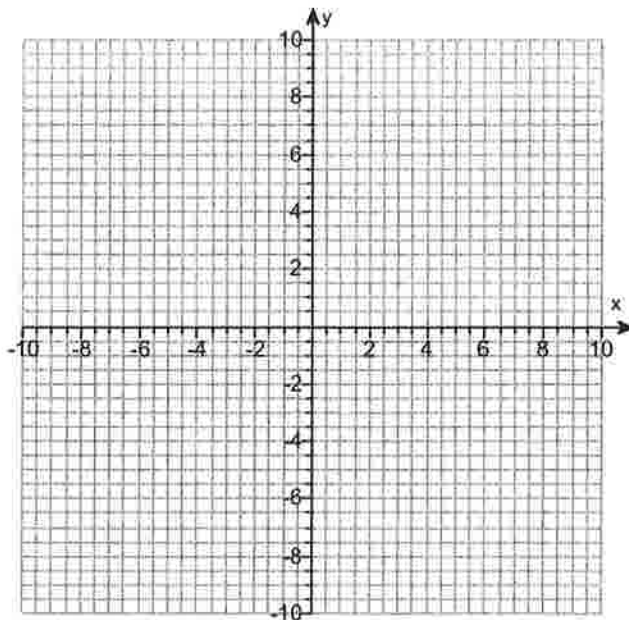
The domain of  $f$  is \_\_\_\_\_.  
(Type your answer in interval notation.)

The range of  $f$  is \_\_\_\_\_.  
(Type your answer in interval notation.)

(c) Determine where the function is increasing and where it is decreasing.

The function is increasing on the interval \_\_\_\_\_.  
(Type your answer in interval notation.)

The function is decreasing on the interval \_\_\_\_\_.



- (1)  down.
- up.

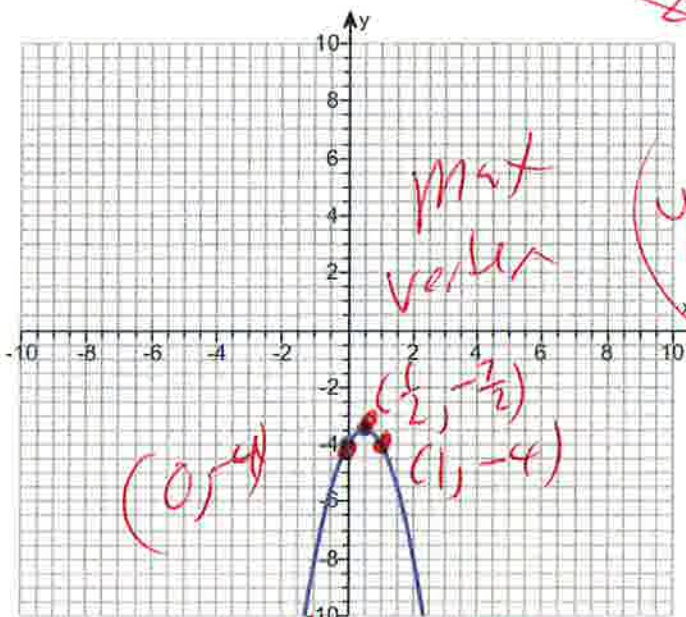
Answers (1) down.

$$\left(\frac{1}{2}, -\frac{7}{2}\right)$$

$$x = \frac{1}{2}$$

A. The y-intercept is -4. (Type an integer or a decimal.)

B. There is no x-intercept.



(0, -4)

max vertex

Window

$$(-\infty, \infty)$$

$$\left(-\infty, -\frac{7}{2}\right]$$

$$\left(-\infty, \frac{1}{2}\right]$$

$$\left[\frac{1}{2}, \infty\right)$$

$x - \text{min} = -12$   
 $x - \text{max} = 12$   
 $y - \text{min} = -10$   
 $y - \text{max} = 10$

Shark Law  
Sharks eat only  
in Day.

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

Example Swimming in the  
Ocean at 2:34 am on  
Saturday night for only  
2 hours by yourself.

You get  
the vertex

Vertex  
max

x	f(x)
0	-4
$\frac{1}{2}$	$-\frac{7}{2}$
1	-4

USP  
Graphing  
Calculator

ID: 2.4.43

Little  
 $y_1 = -2x^2 + 2x - 4$   
 BIG



17. Find the vertical, horizontal, and oblique asymptotes, if any, for the following rational function.

$$R(x) = \frac{16x}{x+5}$$

$$R(x) = \frac{16x}{x+5}$$

set bottom = 0

$$x+5=0$$

$$x+5-5=0-5$$

$$x=-5$$

$$x=-5$$

Select the correct choice below and fill in any answer boxes within your choice.

- A. The vertical asymptote(s) is/are  $x =$  \_\_\_\_\_  
(Use a comma to separate answers as needed.)
- B. There is no vertical asymptote.

Select the correct choice below and fill in any answer boxes within your choice.

- A. The horizontal asymptote(s) is/are  $y =$  \_\_\_\_\_  
(Use a comma to separate answers as needed.)
- B. There is no horizontal asymptote.

vertical asymptote  $x = -5$

Select the correct choice below and fill in any answer boxes within your choice.

- A. The oblique asymptote(s) is/are  $y =$  \_\_\_\_\_  
(Use a comma to separate answers as needed.)
- B. There is no oblique asymptote.

$y = HA = \frac{\text{highest power top}}{\text{highest power bottom}}$

$$y = \frac{16x}{x}$$

Answers A. The vertical asymptote(s) is/are  $x =$  -5  
(Use a comma to separate answers as needed.)

A. The horizontal asymptote(s) is/are  $y =$  16  
(Use a comma to separate answers as needed.)

B. There is no oblique asymptote.

$$y = \frac{16}{1}$$

$$y = 16$$

horizontal asymptote

$$y = 16$$

ID: 3.4.45

since highest power on top is the same as highest power on the bottom then there is no oblique asymptote

18. For  $f(x) = 2x + 8$  and  $g(x) = 4x$ , find the following composite functions and state the domain of each.

(a)  $f \circ g$       (b)  $g \circ f$       (c)  $f \circ f$       (d)  $g \circ g$

(a)  $(f \circ g)(x) = \underline{\hspace{2cm}}$  (Simplify your answer.)

Select the correct choice below and fill in any answer boxes within your choice.

- A. The domain of  $f \circ g$  is  $\{x \mid \underline{\hspace{2cm}}\}$ .  
(Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain of  $f \circ g$  is all real numbers.

(b)  $(g \circ f)(x) = \underline{\hspace{2cm}}$  (Simplify your answer.)

Select the correct choice below and fill in any answer boxes within your choice.

- A. The domain of  $g \circ f$  is  $\{x \mid \underline{\hspace{2cm}}\}$ .  
(Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain of  $g \circ f$  is all real numbers.

(c)  $(f \circ f)(x) = \underline{\hspace{2cm}}$  (Simplify your answer.)

Select the correct choice below and fill in any answer boxes within your choice.

- A. The domain of  $f \circ f$  is  $\{x \mid \underline{\hspace{2cm}}\}$ .  
(Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain of  $f \circ f$  is all real numbers.

(d)  $(g \circ g)(x) = \underline{\hspace{2cm}}$  (Simplify your answer.)

Select the correct choice below and fill in any answer boxes within your choice.

- A. The domain of  $g \circ g$  is  $\{x \mid \underline{\hspace{2cm}}\}$ .  
(Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain of  $g \circ g$  is all real numbers.

Answers  $8x + 8$

B. The domain of  $f \circ g$  is all real numbers.

$8x + 32$

B. The domain of  $g \circ f$  is all real numbers.

$4x + 24$

B. The domain of  $f \circ f$  is all real numbers.

$16x$

B. The domain of  $g \circ g$  is all real numbers.

*inside here*

ID: 4.1.23

(18) 9  $f(x) = 2x + 8$  and  $g(x) = 4x$

$(f \circ g)(x) =$

$f(g(x)) =$

$f(4x) =$

$2(4x) + 8 =$

$8x + 8 =$

Domain  
 $(-\infty, \infty)$

*inside here*

(18) 6  $f(x) = 2x + 8$  and  $g(x) = 4x$

$(g \circ f)(x) =$

$g(f(x)) =$

$g(2x + 8) =$

$4(2x + 8) =$

$8x + 32 =$

Domain  
 $(-\infty, \infty)$

19

(18)c  $f(x) = 2x + 8$  and  $g(x) = 4x$

*inside itself*

$(f \circ f)(x) =$

$$f(f(x)) =$$

$$f(2x + 8) =$$

$$2(2x + 8) + 8 =$$

$$4x + 16 + 8 =$$

$$4x + 24$$

domain

$$(-\infty, \infty)$$

(18)d  $f(x) = 2x + 8$  and  $g(x) = 4/x$

*inside itself*

$$(g \circ g)(x) =$$

$$g(g(x)) =$$

$$g(4/x) =$$

$$4(4/x) =$$

$$16/x =$$

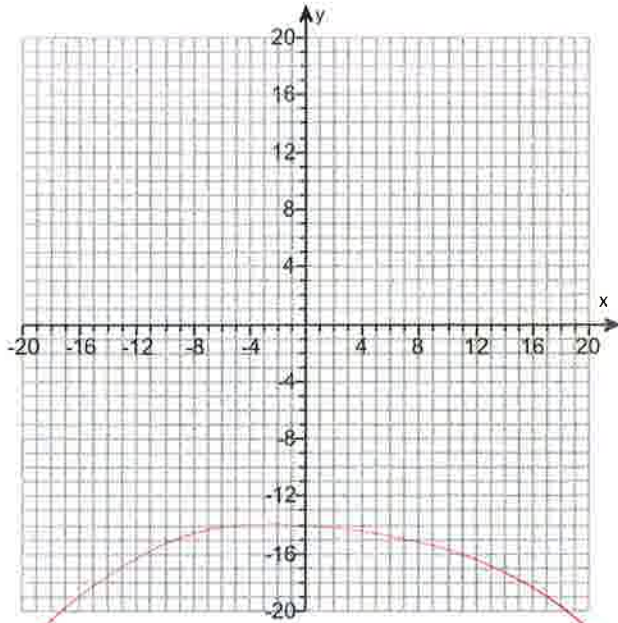
domain

$$(-\infty, \infty)$$

19.

The function  $f(x) = 6x + 3$  is one-to-one.

- (a) Find the inverse of  $f$  and check the answer.
- (b) Find the domain and the range of  $f$  and  $f^{-1}$ .
- (c) Graph  $f$ ,  $f^{-1}$ , and  $y = x$  on the same coordinate axes.



(a)  $f^{-1}(x) =$  \_\_\_\_\_

(Simplify your answer. Use integers or fractions for any numbers in the expression.)

(b) Find the domain of  $f$ . Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The domain is  $\{x|x \geq$  \_\_\_\_\_ $\}$ .
- B. The domain is  $\{x|x \leq$  \_\_\_\_\_ $\}$ .
- C. The domain is  $\{x|x \neq$  \_\_\_\_\_ $\}$ .
- D. The domain is the set of all real numbers.

Find the range of  $f$ . Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The range is  $\{y|y \neq$  \_\_\_\_\_ $\}$ .
- B. The range is  $\{y|y \leq$  \_\_\_\_\_ $\}$ .
- C. The range is  $\{y|y \geq$  \_\_\_\_\_ $\}$ .
- D. The range is the set of all real numbers.

Find the domain of  $f^{-1}$ . Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The domain is  $\{x|x \geq$  \_\_\_\_\_ $\}$ .
- B. The domain is  $\{x|x \leq$  \_\_\_\_\_ $\}$ .
- C. The domain is  $\{x|x \neq$  \_\_\_\_\_ $\}$ .
- D. The domain is the set of all real numbers.

Find the range of  $f^{-1}$ . Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The range is  $\{y|y \geq$  \_\_\_\_\_ $\}$ .
- B. The range is  $\{y|y \neq$  \_\_\_\_\_ $\}$ .
- C. The range is  $\{y|y \leq$  \_\_\_\_\_ $\}$ .
- D. The range is the set of all real numbers.

Handwritten work in red ink:

$$f(x) = 6x + 3$$

$$y = 6x + 3$$

Set  $y =$   
Inv var

$$x = 6y + 3$$

Solve for  $y$

$$x - 3 = 6y + 3 - 3$$

$$x - 3 = 6y$$

$$\frac{x - 3}{6} = \frac{6y}{6}$$

$$\frac{x - 3}{6} = y$$

rewrite

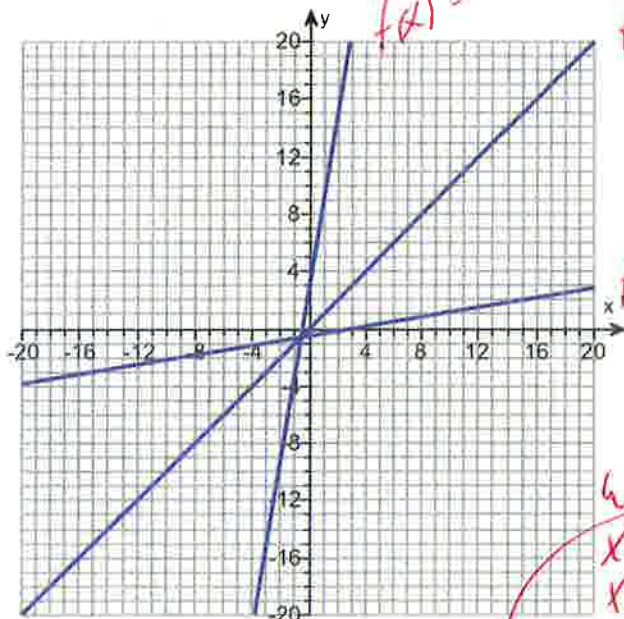
$$y = \frac{x - 3}{6}$$

inverse

$$f^{-1}(x) = \frac{x - 3}{6}$$

Answers  $\frac{x-3}{6}$

- D. The domain is the set of all real numbers.
- D. The range is the set of all real numbers.
- D. The domain is the set of all real numbers.
- D. The range is the set of all real numbers.



$y_1 = 6x + 3$   
 $y_2 = x$

$f(x) = (x-3) \div (6)$   
 $y_3 = (x-3) \div (6)$

Windows  
 x-min = -12  
 x-max = 12  
 y-min = -10  
 y-max = 10

Use  
 Graphing  
 Calculator

ID: 4.2.53

20. Solve the equation.

$32^{-x+26} = 256^x$

The solution set is { }.

(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

Answer: 10

$2^{-5x+130} = 2^{8x}$   
 $-5x + 130 = 8x$

ID: 4.3.73

$-5x + 130 - 130 = 8x - 130$

$-5x = 8x - 130$

$-5x - 8x = 8x - 130 - 8x$

$-13x = -130$

$\frac{-13x}{-13} = \frac{-130}{-13}$

$x = 10$

Primes  
 2, 3, 5, 7, 11, 13, ...  
 Rewrite

$2 \overline{) 32}$   
 2  
 2  
 2  
 2  
 2  
 2  
 1

$2 \overline{) 256}$   
 2  
 2  
 2  
 2  
 2  
 2  
 2  
 2  
 2  
 2  
 1

$32 = 2^5$

factorial  
 $256 = 2^8$

21. The function

$D(h) = 7e^{-0.61h}$

$D(h) = 7e^{-0.61h}$

can be used to find the number of milligrams D of a certain drug that is in a patient's bloodstream h hours after the drug has been administered. How many milligrams will be present after 1 hour? After 11 hours?

After 1 hour, there will be \_\_\_\_\_ milligrams. (Round to two decimal places as needed.)

After 11 hours, there will be \_\_\_\_\_ milligrams. (Round to two decimal places as needed.)

Answers 3.80

0.01

$D(1) = 7e^{(-0.61(1))}$   
 $D(1) = 3.803456084$   
 $D(1) = 3.80$  Round

$D(11) = 7e^{(-0.61(11))}$   
 $D(11) = .0085306989$   
 $D(11) = 0.01$  Round

ID: 4.3.111

22. Solve the equation.

$\log_2(2x + 1) = 4$

formula  
Wax on  
Wax off

$\log_2(2x+1) = 4$

$2^4 = 2x+1$

rewrite

Change the given logarithmic equation to exponential form.

$2 \cdot 2 \cdot 2 \cdot 2 = 2x+1$

(Type an equation. Do not simplify.)

$16 = 2x+1$

The solution set is {\_\_\_\_\_}.

$16 - 1 = 2x + 1 - 1$

(Simplify your answer. Use a comma to separate answers as needed.)

$15 = 2x$

Answers  $2x + 1 = 2^4$

$15 = 2x$

$\frac{15}{2}$

$\frac{15}{2} = x$

ID: 4.4.91-Setup & Solve

23. Write the expression as a sum and/or difference of logarithms. Express powers as factors.

$\log \left[ \frac{x(x+7)}{(x+8)^4} \right], x > 0$

$\log \left( \frac{x(x+7)}{(x+8)^4} \right) =$

$\log \left[ \frac{x(x+7)}{(x+8)^4} \right] =$  (Simplify your answer.)

$\log x(x+7) - \log (x+8)^4 =$

Answer:  $\log x + \log(x+7) - 4 \log(x+8)$

$\log(x) + \log(x+7) - 4 \log(x+8) =$

ID: 4.5.51

$\log(x) + \log(x+7) - 4 \log(x+8) =$

formula

$\log \left( \frac{A}{B} \right) = \log(A) - \log(B)$

$\log(A^N) = N \log(A)$

$\log(AB) = \log(A) + \log(B)$

24. Solve the logarithmic equation.

log x + log (x + 15) = 2

Determine the equation to be solved after removing the logarithm.

(Type an equation. Do not simplify.)

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The solution set is { } (Simplify your answer. Type an exact answer. Use a comma to separate answers as needed.)

B. There is no solution.

Answers x(x + 15) = 10^2

A. The solution set is { } (Simplify your answer. Type an exact answer. Use a comma to separate answers as needed.)

ID: 4.6.17-Setup & Solve

25. Find the amount that results from the given investment.

\$500 invested at 12% compounded quarterly after a period of 3 years

After 3 years, the investment results in \$ (Round to the nearest cent as needed.)

Answer: 712.88

ID: 4.7.7

26. How many years will it take for an initial investment of \$20,000 to grow to \$70,000? Assume a rate of interest of 2% compounded continuously.

It will take about years for the investment to grow to \$70,000. (Round to two decimal places as needed.)

Answer: 62.64

ID: 4.7.41

Handwritten solutions for problem 26: ln(3.5) = ln(e^0.02t), ln(3.5) = 0.02t ln(e), ln(3.5) = 0.02t(1), ln(3.5) = 0.02t

Handwritten formula: log(A) + log(B) = log(AB)

Handwritten answer: x = 5 only

Handwritten work for problem 24: x-5=0 OR x+20=0, x=5 OR x=20, log(5)+log(5+15)=2, log(5)+log(20)=2, log(-20)+log(-20+15)=2, log(-20)+log(-5)=2

Handwritten work for problem 25: A=500, r=12% = 0.12, n=4, t=3 years

Handwritten work for problem 25: A=712.88

Handwritten work for problem 26: ln(3.5) = 0.02t, 62.63814842 = t

Handwritten work for problem 26: 62.64 = t



27. Solve the system of equations. If the system has no solution, say that it is inconsistent.

$$\begin{cases} 2x - 3y = -7 \\ 5x + y = 8 \end{cases}$$

*Mult*

$$\begin{array}{r} (1) \quad 2x - 3y = -7 \\ (3) \quad 15x + 3y = 24 \\ \hline 17x + 0 = 17 \end{array}$$

$$\frac{17x}{17} = \frac{17}{17}$$

$$x = 1$$

*Subst*

Select the correct choice below and, if necessary, fill in any answer boxes within your choice.

- A. The solution of the system is  $x =$  \_\_\_\_\_ and  $y =$  \_\_\_\_\_. (Type an integers or simplified fractions.)
- B. There are infinitely many solutions. Using ordered pairs, the solution can be written as  $\{(x,y) \mid x =$  \_\_\_\_\_,  $y$  any real number $\}$ . (Simplify your answer. Type an expression using  $y$  as the variable as needed.)
- C. The system is inconsistent.

$$\begin{array}{r} 2x - 3y = -7 \\ 2(1) - 3y = -7 \\ 2 - 3y = -7 \\ 2 - 3y - 2 = -7 - 2 \\ -3y = -9 \\ \frac{-3y}{-3} = \frac{-9}{-3} \\ y = 3 \end{array}$$

Answer: A. The solution of the system is  $x =$  1 and  $y =$  3. (Type an integers or simplified fractions.)

ID: 6.1.33

$(x, y) = (1, 3)$

28. Solve the given system of equations. If the system has no solution, say that it is inconsistent.

$$\begin{cases} x - 2y + 3z = 16 \\ 2x + y + z = 2 \\ -3x + 2y - 2z = -15 \end{cases}$$

*RND, Matrix, Edit, Enter, 3x4, into*

$$[A] = \begin{bmatrix} 1 & -2 & 3 & 16 \\ 2 & 1 & 1 & 2 \\ -3 & 2 & -2 & -15 \end{bmatrix}$$

*Use graphing calculator*

Select the correct choice below and fill in any answer boxes within your choice.

- A. The solution is  $x =$  \_\_\_\_\_,  $y =$  \_\_\_\_\_, and  $z =$  \_\_\_\_\_. (Type integers or simplified fractions.)
- B. There are infinitely many solutions. Using ordered triplets, they can be expressed as  $\{(x,y,z) \mid x =$  \_\_\_\_\_,  $y =$  \_\_\_\_\_,  $z$  any real number $\}$ . (Simplify your answers. Type expressions using  $z$  as the variable as needed.)
- C. There are infinitely many solutions. Using ordered triplets, they can be expressed as  $\{(x,y,z) \mid x =$  \_\_\_\_\_,  $y$  any real number,  $z$  any real number $\}$ . (Simplify your answer. Type an expression using  $y$  and  $z$  as the variables as needed.)
- D. The system is inconsistent. *RND matrix, math, Vref*

Answer: A.

The solution is  $x =$  1,  $y =$  -3, and  $z =$  3. (Type integers or simplified fractions.)

ID: 6.1.45

*Vref*

$$[A] = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & -3 \\ 0 & 0 & 1 & 3 \end{bmatrix}$$

$(x, y, z)$

$(1, -3, 3)$

29. Find the sum of the sequence.

$$\sum_{k=1}^6 (8k+9)$$

OR use graphing calculator  
 MATH, ↓, summation Σ

$$\sum_{k=1}^6 (8k+9) = \underline{\hspace{2cm}}$$

$$(8(1)+9) + (8(2)+9) + (8(3)+9) + (8(4)+9) + (8(5)+9) + (8(6)+9) =$$

Answer: 222

$$(8+9) + (16+9) + (24+9) + (32+9) + (40+9) + (48+9) =$$

$$(17) + (25) + (33) + (41) + (49) + (57) =$$

ID: 7.1.73

222

30. Expand the expression using the binomial theorem.

use graphing calculator

$$(x+3)^4$$

$${}^4_0 C(x)^4(3)^0 + {}^4_1 C(x)^3(3)^1 + {}^4_2 C(x)^2(3)^2 + {}^4_3 C(x)^1(3)^3 + {}^4_4 C(x)^0(3)^4 =$$

$$(x+3)^4 =$$

$$(1)(x^4)(1) + (4)(x^3)(3) + (6)(x^2)(9) + (4)(x)(27) + (1)(1)(81) =$$

Answer:  $x^4 + 12x^3 + 54x^2 + 108x + 81$

$$x^4 + 12x^3 + 54x^2 + 108x + 81 =$$

ID: 7.5.17

31. Find the real solutions of the equation.

$$7 + \sqrt{3x-11} = x$$

$$\sqrt{3x-11} = x-7 \quad \text{Rewrite}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your answer.

- A. The solution set is  $\{\hspace{2cm}\}$ .  
(Simplify your answer. Use a comma to separate answers as needed.)
- B. The solution is the empty set.

Answer: A. The solution set is  $\{ \underline{12} \}$ .  
(Simplify your answer. Use a comma to separate answers as needed.)

ID: A.8.55

$$(\sqrt{3x-11})^2 = (x-7)^2$$

$$3x-11 = (x-7)(x-7)$$

$$3x-11 = x^2 - 7x - 7x + 49$$

$$3x-11 = x^2 - 14x + 49$$

$$0 = x^2 - 14x + 49 - 3x + 11$$

$$0 = x^2 - 17x + 60$$

Next  
 Post  
 please!

Square Both Sides

$$0 = x^2 - 17x + 60$$

$$0 = (x-5)(x-12)$$

$$x-5=0 \quad \text{OR} \quad x-12=0$$

$$x-5+5=0+5 \quad \text{OR} \quad x-12+12=0+12$$

$$x=5$$

$$\text{OR} \quad x=12$$

Possible

$$60 \cdot 1$$

$$30 \cdot 2$$

$$15 \cdot 4$$

$$12 \cdot 5$$

$$10 \cdot 6$$

Check

$$7 + \sqrt{3x-11} = x$$

Try  $x=5$

$$7 + \sqrt{3(5)-11} = 5$$

$$7 + \sqrt{15-11} = 5$$

$$7 + \sqrt{4} = 5$$

$$7 + 2 = 5$$

$$9 \neq 5$$

BAD

$$7 + \sqrt{3x-11} = x$$

Try  $x=12$

$$7 + \sqrt{3(12)-11} = 12$$

$$7 + \sqrt{36-11} = 12$$

$$7 + \sqrt{25} = 12$$

$$7 + 5 = 12$$

$$12 = 12 \quad \text{Good}$$

Answer ✓✓

$$x=12$$

only



value: 1 ticket

value: 1 ticket

APIT

Love sprinkles Forever surfboard

GOLDEN CARD

SPRING BREAK BEAR

IN THE SEA ON A PIZZA Hot day.

WAVE

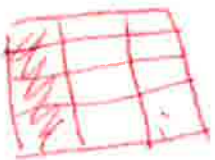
WAVE



SMART Bird

5-8-17  
ARIE

$$\frac{1}{3} \times \frac{4}{4} = \frac{4}{12}, \quad \frac{2}{4} \times \frac{3}{3} = \frac{6}{12}$$



$$\frac{4}{12} + \frac{6}{12} = \frac{10}{12} = \frac{5}{6}$$

$$\frac{12}{12} - \frac{10}{12} = \frac{2}{12} \text{ or } \frac{1}{6}$$

MARI MARI MARI



MATH is FUN

# BROKEN SURFBOARD



MATHS

12/11/19

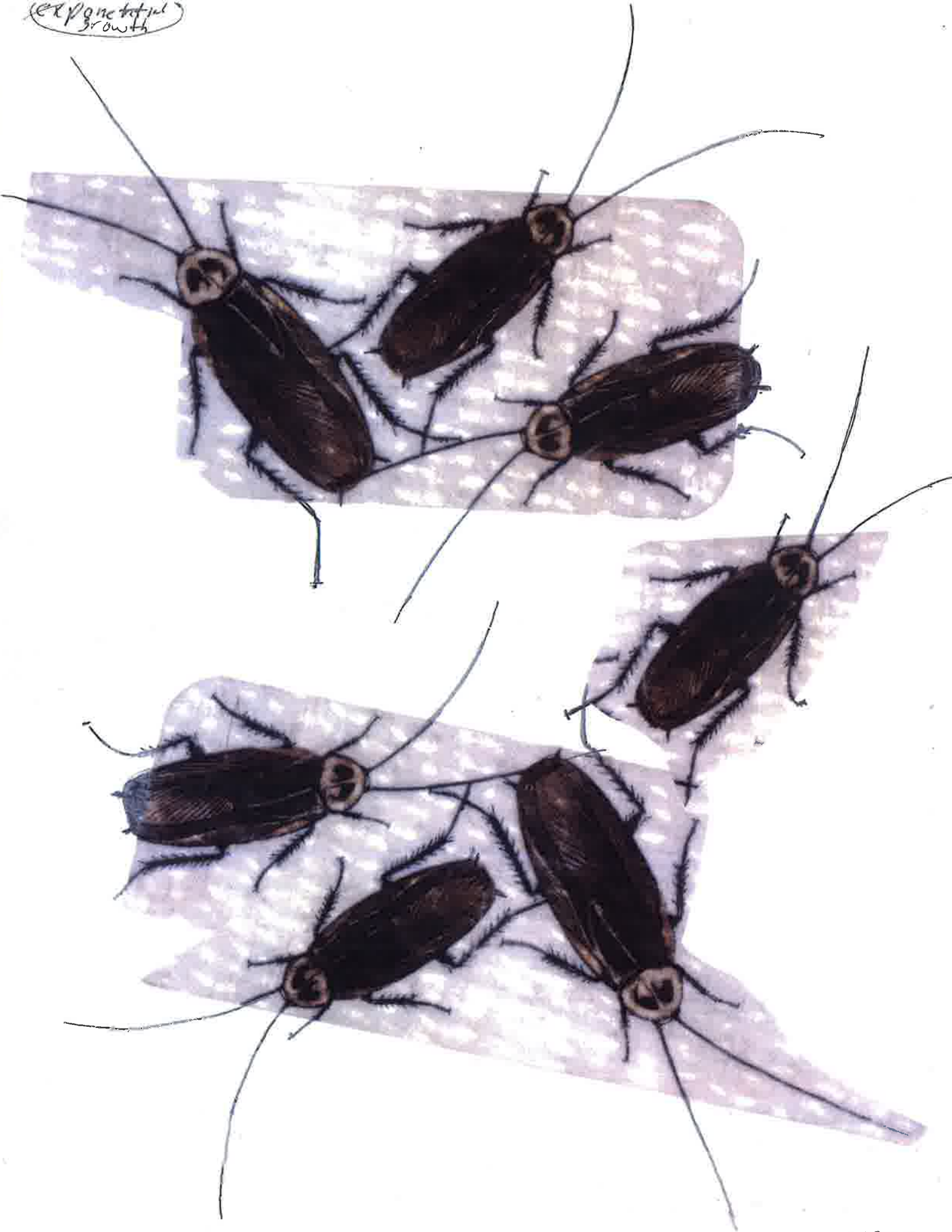


12/11/19 AP16





(exponential growth)



090314

exponential growth



090315a