

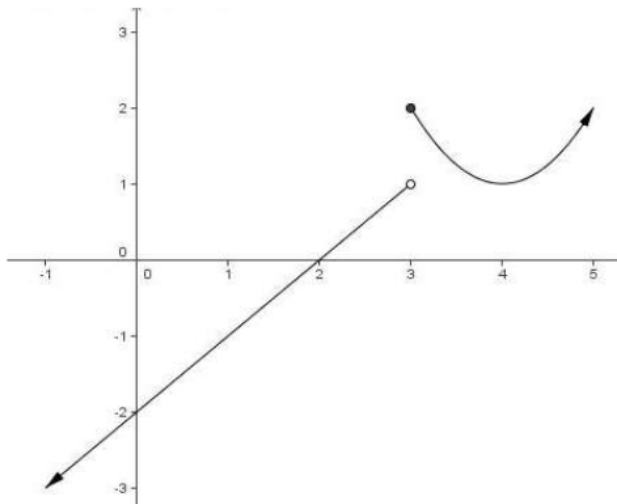
Test Tomorrow!!

Hand back quizzes - grab quiz folders

Name: _____ Hour: _____

Standard 4B Piecewise Functions Form A

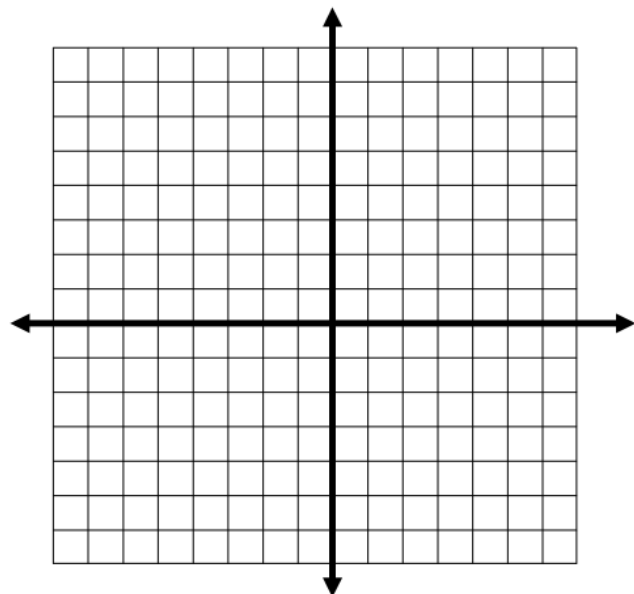
1. Write a Piece wise function for the given graph.



$$f(x) = \left\{ \right.$$

2. Sketch a graph of the piecewise function. Then evaluate the function at the specified domain values.

$$f(x) = \begin{cases} 3 & x \leq -1 \\ x^2 - 1 & -1 < x \leq 2 \\ x + 2 & x > 2 \end{cases}$$



$f(-3) =$

$f(2) =$

$f(4) =$

Name: _____ Hour: _____

Standard 4C Combining Functions - Form A

Given: $f(x) = 6x - 1$ $g(x) = 8x - 4$ $h(x) = 2x^2 + 5$

Find the following:

<p>1. $(f + g)(x)$</p> <p>A. $48x^2 - 32x + 4$ B. $48x - 25$ C. $14x - 5$ D. $2x - 5$</p>	<p>2. $(f \circ g)(x)$</p> <p>A. $48x - 25$ B. $48x - 4$ C. $48x - 12$ D. $48x - 3$</p>	<p>3. $(h - f)(2)$</p> <p>A. $2(2x^2 - 6x + 6)$ B. 2 C. $2x^2 - 6x + 6$ D. 247</p>
<p>4. $(g \cdot h)(0)$</p> <p>A. 29 B. 0 C. 36 D. -20</p>	<p>5. $\left(\frac{g}{h}\right)(1)$</p> <p>A. $\frac{3}{5}$ B. $-\frac{4}{5}$ C. $-\frac{1}{7}$ D. $\frac{4}{7}$</p>	<p>6. $f(g(-1))$</p> <p>A. -73 B. 23 C. 55 D. 41</p>
<p>7. $\left(\frac{g}{h}\right)(x)$</p> <p>A. $\frac{4x - 4}{x^2 + 5}$ B. $\frac{8x - 4}{2x^2 + 5}$ C. $\frac{8x - 4}{6x - 1}$ D. $\frac{2x^2 + 5}{8x - 4}$</p>	<p>8. $(h \circ f)(5)$</p> <p>A. 228 B. 63 C. 3369 D. 1687</p>	<p>9. $(f + g)(3)$</p> <p>A. 119 B. 37 C. 132 D. 45</p>

WHITEBOARDS



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

$$g(x) = 3x^2 - 5$$

$$(f - g)(x) =$$

$$(f - g)(0) =$$

$$\begin{array}{r} (-4x+3) - (3x^2-5) \end{array}$$

$$\begin{array}{r} \underline{-4x+3} \quad \underline{-3x^2+5} \end{array}$$

$$\begin{array}{r} -3x^2 - 4x + 8 \\ 0 - 0 + 8 = 8 \end{array}$$

Write the equation for the given function:

A square root function ✓ - $y = -7\sqrt{x+1} + 5$

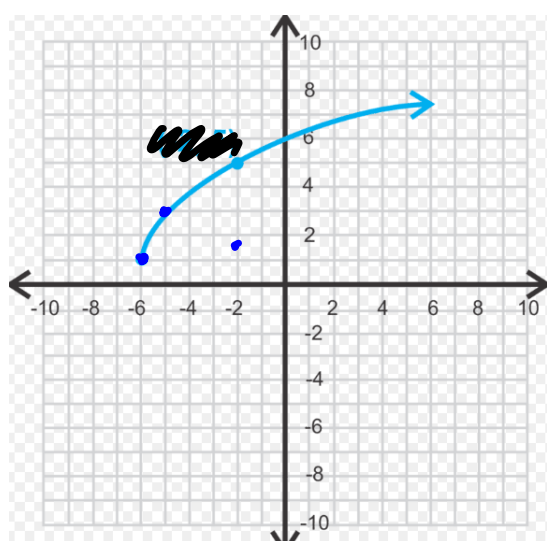
Reflected over x-axis ✓

Shifted left 1 ✓

Shifted up 5 ✓

Stretched by a factor of 7 ✓

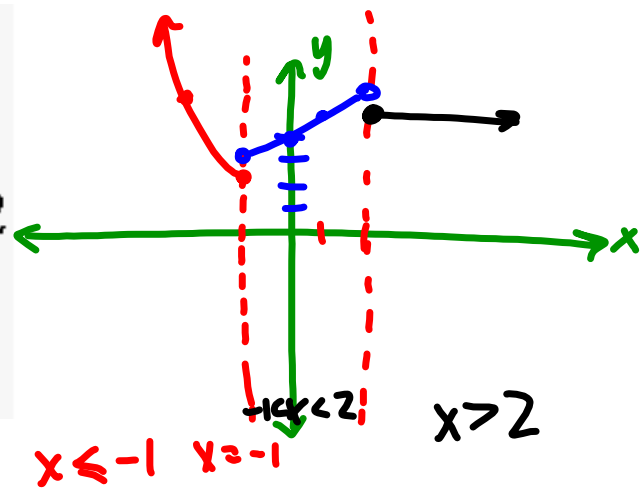
Write the equation of the graph shown



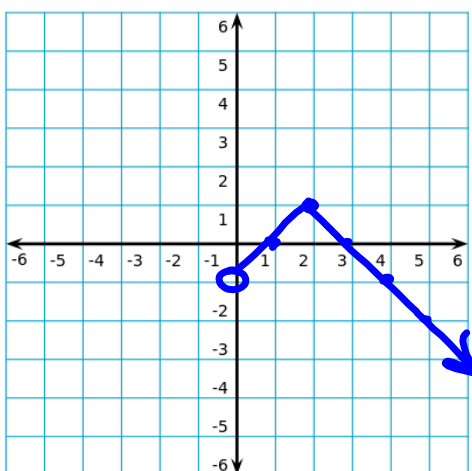
$$y = 2\sqrt{x+6} + 1$$

Graph:

$$f(x) = \begin{cases} x^2 + 1; & x \leq -1 \\ x + 4; & -1 < x < 2 \\ 5; & x \geq 2 \end{cases}$$

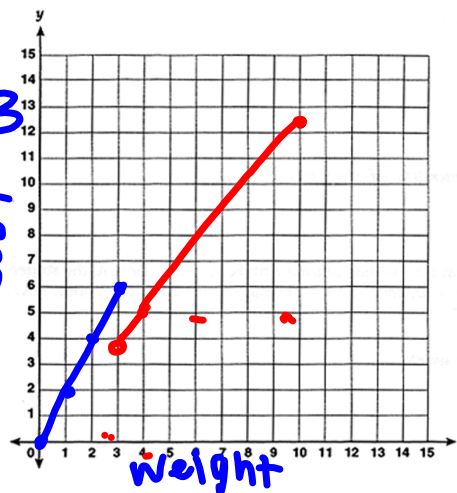


Graph $f(x) = -|x - 2| + 1$ with domain $x > 0$



Walmart is having a sale on raspberries. They cost \$2 per pound up 3 pounds. If you buy over 3 pounds they cost \$1.25 per pound. Express the cost as a function of weight. Write and graph the piecewise function.

$$f(x) = \begin{cases} 2x, & 0 \leq x \leq 3 \\ 1.25x, & x > 3 \end{cases}$$



Identify the vertex of the function

$$f(x) = (x + 1)^2$$

$(-1, 0)$

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

$$g(x) = 3x - 5$$

$$(g \circ f)(x) \quad g(\underline{f(x)}) \quad (g \circ f)(3)$$

$$3(-4x + 3) - 5$$

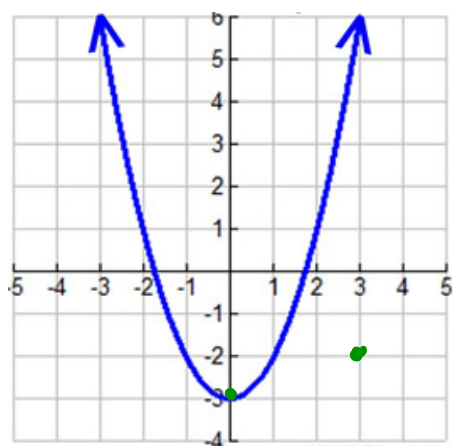
$$-12x + 9 - 5$$

$$-12x + 4$$

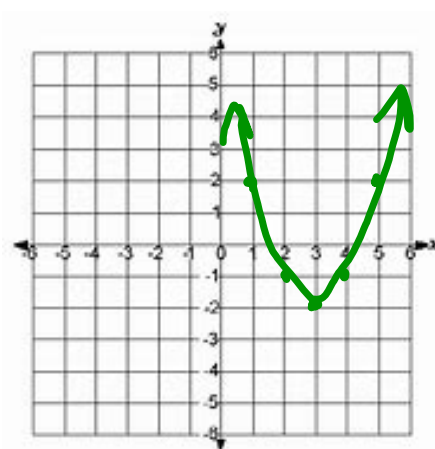
$$-12(3) + 4$$

$$-36 + 4 = -32$$

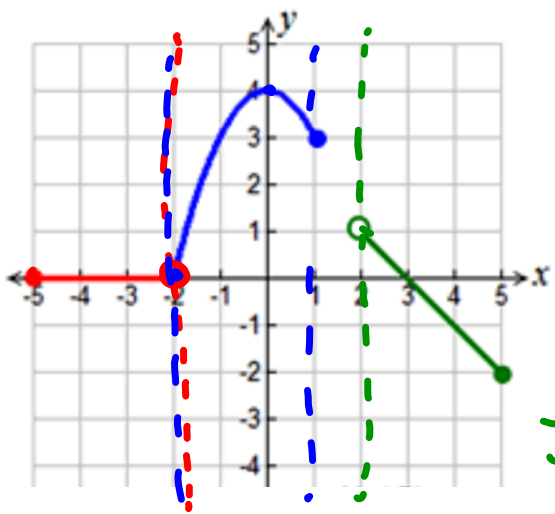
$f(x)$ is shown below.



Graph $g(x)$ if $g(x) = f(x - 3) + 1$



Write an equation for the piecewise function



$$f(x) = \begin{cases} 0, & -5 \leq x < -2 \\ -x^2 + 4, & -2 \leq x \leq 1 \\ -x + 3, & 2 < x \leq 5 \end{cases}$$

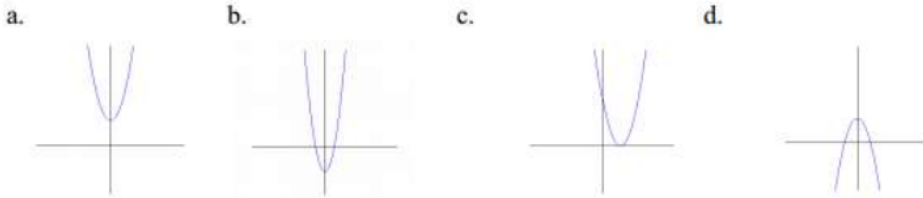
$-\frac{|x-2|}{1}$ →

due tomorrow

Ch 4 Practice Test - Functions

Name: _____

1. Circle the graph that best matches the function: $f(x) = 2x^2 - 2$



2. Which equation will shift the graph of $y = x^2$ left 5 units and up 6 units?

- a. $y = (x+6)^2 - 5$
- b. $y = (x+5)^2 - 6$
- c. $y = (x+5)^2 + 6$
- d. $y = (x-5)^2 + 6$

3. What is the vertex for the quadratic equation $y = (x+3)^2 - 2$.

- a. (3, 2)
- b. (-3, -2)
- c. (-2, 3)
- d. (2, -3)

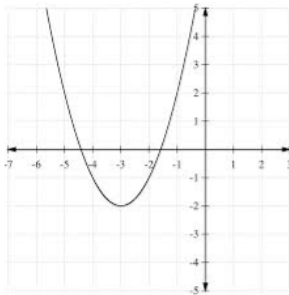
Given the parent function and a description of the transformation, write the equation of the transformed function, $f(x)$.

4. An absolute value function with a reflection across the x-axis, vertical shift up 5, and a horizontal shift right 3.

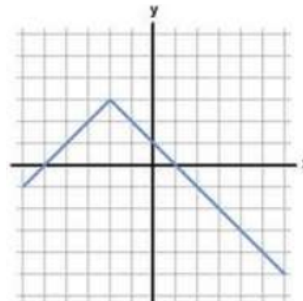
5. A quadratic function with a vertical stretch/compression by $\frac{2}{5}$, and a vertical shift down 2.

6. A square root function that has a stretch of 4, shifted left 3 units, and down 1.

Write a function $f(x)$ to describe the following graphs:



7. _____

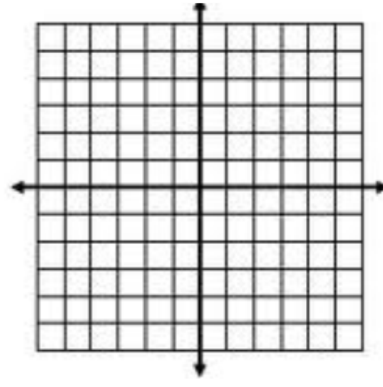
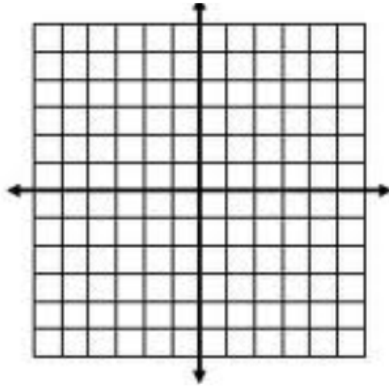


8. _____

Graph the following piecewise functions:

$$9. f(x) = \begin{cases} x-4, & \text{if } x \leq 1 \\ 3x, & \text{if } x > 3 \end{cases}$$

$$10. f(x) = \begin{cases} -3x-1, & \text{if } x \leq 1 \\ (x-2)^2, & \text{if } x > 1 \end{cases}$$



Evaluate the function for the given value of x. $f(x) = \begin{cases} x-2, & \text{if } x < 0 \\ 3, & \text{if } x \geq 0 \end{cases}$

$g(x) = \begin{cases} 2x-1, & \text{if } x \leq -3 \\ 4x, & \text{if } x > -3 \end{cases}$

11. $f(0)$

12. $f(4)$

13. $g(-2)$

COMBINING FUNCTIONS

Use the following functions to perform the given operation.

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

$$g(x) = x^2 + 1$$

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

14. $(g + h)(x)$

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

16. $f(g(x))$

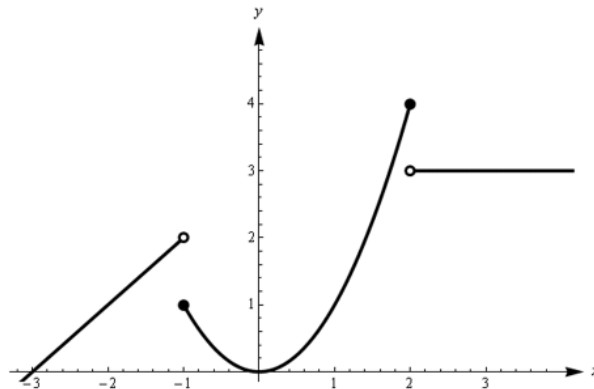
17. $(f \cdot g)(-1)$

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

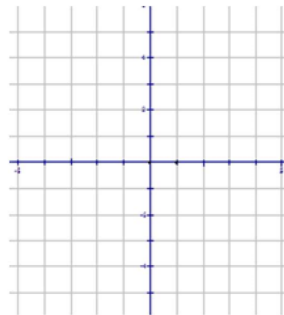
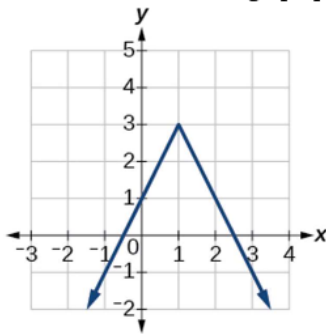
19. $(g + h)(0)$

20. $(f \cdot h)(x)$

21. Write a piecewise function for the graph.



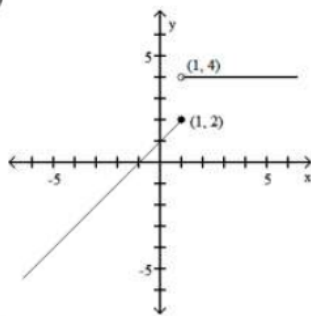
22. Let $f(x)$ be the function represented by the graph below. Perform the indicated transformation and graph the new function on the graph provided. $k(x) = -f(x - 2)$



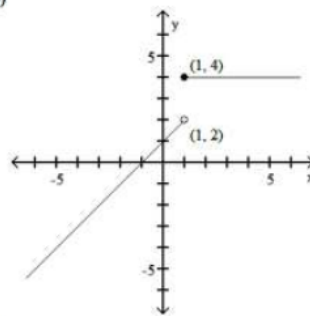
23. Match the piecewise function to its graph.

$$f(x) = \begin{cases} x + 1 & \text{if } x < 1 \\ 4 & \text{if } x \geq 1 \end{cases}$$

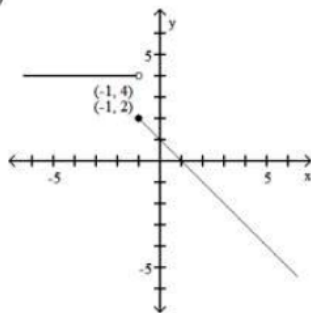
A)



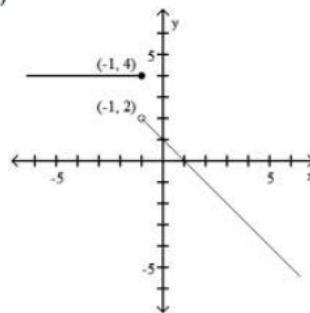
B)



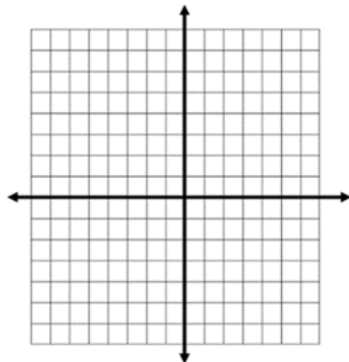
C)



D)



24. Graph the following function with the restricted domain.

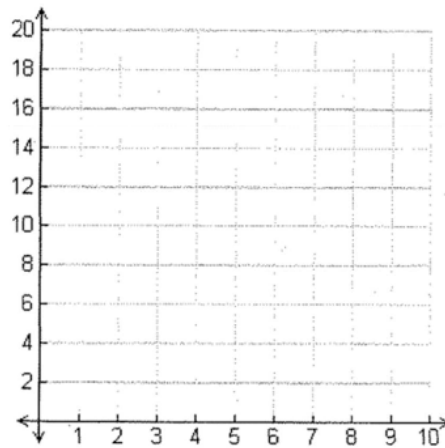


$$y = 2x - 1, \quad x \leq 3$$

25. A supermarket has a discount on bulk candy. Candy costs \$3.50/lb up to 5 lbs. If you buy over 5 lbs. the cost is \$3.00/lb. Express the cost as a function of weight.

a. Write the piecewise function.

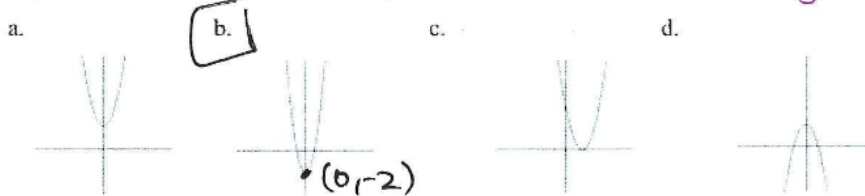
b. Graph the function.



Ch 4 Practice Test - Functions

Name: Key

1. Circle the graph that best matches the function: $f(x) = 2x^2 - 2$



2. Which equation will shift the graph of $y = x^2$ left 5 units and up 6 units?

- a. $y = (x+6)^2 - 5$
- b. $y = (x+5)^2 - 6$
- c. $y = (x+5)^2 + 6$
- d. $y = (x-5)^2 + 6$

+5 +6

3. What is the vertex for the quadratic equation $y = (x+3)^2 - 2$.

- a. (3, 2)
- b. (-3, -2)
- c. (-2, 3)
- d. (2, -3)

(-3, -2)

Given the parent function and a description of the transformation, write the equation of the transformed function, $f(x)$.

4. An absolute value function with a reflection across the x-axis, vertical shift up 5, and a horizontal shift right 3.

$q = -4$ $y = -|x - 3| + 5$

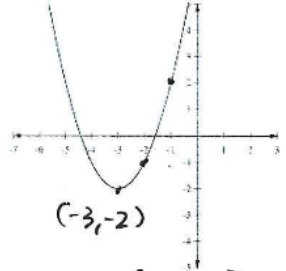
5. A quadratic function with a vertical stretch/compression by $\frac{2}{5}$, and a vertical shift down 2.

$y = \frac{2}{5}(x)^2 - 2$ or $y = \frac{2}{5}x^2 - 2$

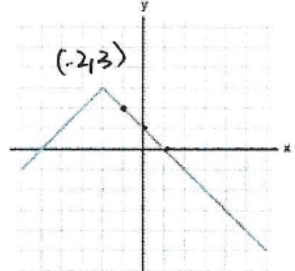
6. A square root function that has a stretch of 4, shifted left 3 units, and down 1.

$y = 4\sqrt{x + 3} - 1$

Write a function $f(x)$ to describe the following graphs:



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

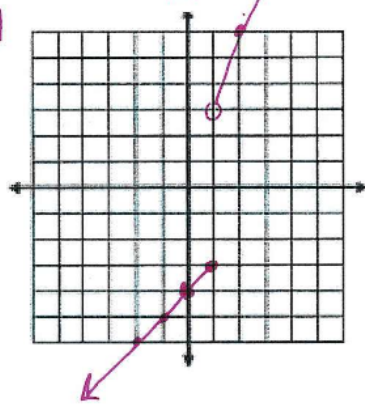


8. $y = -|x+2| - 3$

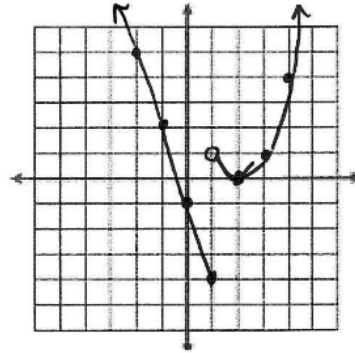
Graph the following piecewise functions:

Change domain on bottom to $x > 1$

9. $f(x) = \begin{cases} x-4, & \text{if } x \leq 1 \\ 3x, & \text{if } x > 1 \end{cases}$



10. $f(x) = \begin{cases} -3x-1, & \text{if } x \leq 1 \\ (x-2)^2, & \text{if } x > 1 \end{cases}$



Evaluate the function for the given value of x. $f(x) = \begin{cases} x-2, & \text{if } x < 0 \\ 3, & \text{if } x \geq 0 \end{cases}$

$g(x) = \begin{cases} 2x-1, & \text{if } x \leq -3 \\ 4x, & \text{if } x > -3 \end{cases}$

11. $f(0) = 3$

12. $f(4) = 3$

13. $g(-2)$

$4(-2) = -8$

COMBINING FUNCTIONS

Use the following functions to perform the given operation.

$f(x) = 3 - 2x$

$g(x) = x^2 + 1$

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

14. $(g+h)(x)$

$x^2 + 1 + x^2 - 3x + 4$
 $= 2x^2 - 3x + 5$

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

$\frac{x^2 + 1}{3 - 2x}$ $x \neq \frac{3}{2}$

$3 - 2x = 0$
 $-2x = -3$
 $x = \frac{3}{2}$

16. $f(g(x))$

$3 - 2(x^2 + 1)$
 $= 3 - 2x^2 - 2$
 $= -2x^2 + 1$

17. $(f \cdot g)(-1)$

$(3 - 2x)(x^2 + 1)$
 $= 3x^2 + 3 - 2x^3 - 2x$
 $= -2x^3 + 3x^2 - 2x + 3$
 $f \cdot g(-1) =$
 $-2(-1)^3 + 3(-1)^2 - 2(-1) + 3 = 10$

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

$3 - 2x - (x^2 + 1)$
 $= 3 - 2x - x^2 - 1$
 $= -x^2 - 2x + 2$
 $-(2)^2 - 2(2) + 2$
 $= -4 - 4 + 2$
 $= -6$

19. $(g+h)(0)$

$2x^2 - 3x + 5$
 $2(0)^2 - 3(0) + 5$
 $= 5$

20. $(f \cdot h)(x)$

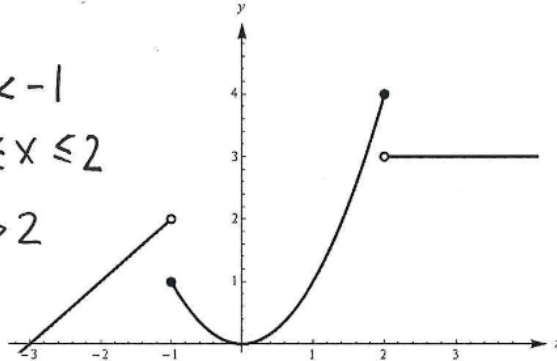
$(3 - 2x)(x^2 - 3x + 4)$

	3	-2x	
x^2	$3x^2$	$-2x^3$	$-2x^3 + 9x^2 - 17x + 12$
$-3x$	$-9x$	$6x^2$	
$+4$	12	$-8x$	
	$f \cdot h = 2x^3 + 9x^2 - 17x + 12$		

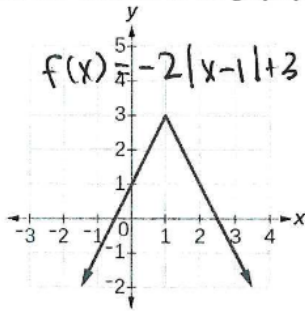
21. Write a piecewise function for the graph.

$$f(x) = \begin{cases} x + 3, & x < -1 \\ x^2, & -1 \leq x \leq 2 \\ 3, & x > 2 \end{cases}$$

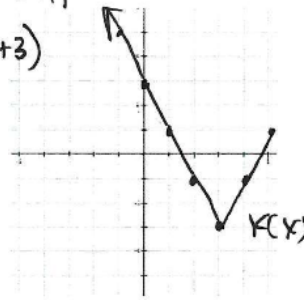
$$\begin{cases} x < -1 \\ -1 \leq x \leq 2 \\ x > 2 \end{cases}$$



22. Let $f(x)$ be the function represented by the graph below. Perform the indicated transformation and graph the new function on the graph provided. $k(x) = -f(x - 2)$ flip over x-axis first, then right 2

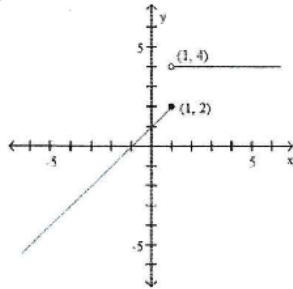


$$\begin{aligned} f(x) &= -2|x-1|+3 \\ k(x) &= -(-2|x-2-1|+3) \\ &= -(-2|x-3|+3) \\ &= 2|x-3|-3 \end{aligned}$$

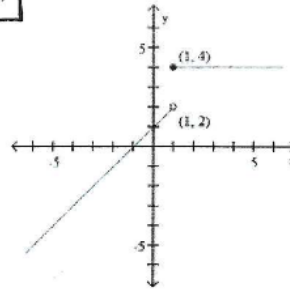


23. Match the piecewise function to its graph. $f(x) = \begin{cases} x + 1 & \text{if } x < 1 \\ 4 & \text{if } x \geq 1 \end{cases}$

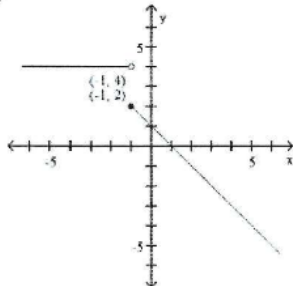
A)



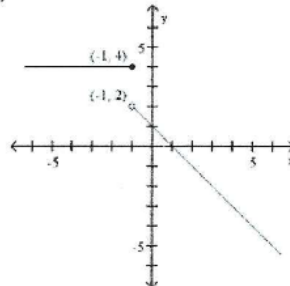
B)



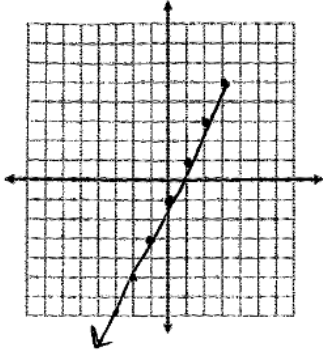
C)



D)



24. Graph the following function with the restricted domain.



$$y = 2x - 1, \quad x \leq 3$$

25. A supermarket has a discount on bulk candy. Candy costs \$3.50/lb up to 5 lbs. If you buy over 5 lbs, the cost is \$3.00/lb. Express the cost as a function of weight.

a. Write the piecewise function.

$$f(x) = \begin{cases} 3.50x, & 0 \leq x \leq 5 \\ 3.00x, & x > 5 \end{cases}$$

b. Graph the function.

