

Get out ws 4.8 and Wk 2 Hw Tracker

Correct 4.8 ws...

Sec. 4.8

key

Composition and Combinations of Functions

Find $(f \circ g)(x)$ of the following functions:

1. $f(x) = 2x - 3$, $g(x) = 3x$
 $2(3x) - 3$
 $6x - 3$

2. $f(x) = \frac{1}{2}x - 3$, $g(x) = \frac{1}{4}x$
 $\frac{1}{2}(\frac{1}{4}x) - 3$
 $\frac{1}{8}x - 3$ or $.125x - 3$

Find $(g \circ f)(x)$ of the following functions:

3. $f(x) = x^2$, $g(x) = 5x$
 $5x^2$

4. $f(x) = -3x + 3$, $g(x) = 6x$
 $-18x + 18$

Given the following functions, find each composite function value.

$f(x) = -\frac{1}{2}x + 4$

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

$h(x) = 2x + 5$

5. $(h \circ g)(-1)$
 $g(-1) = (-1)^2 - 1 = 0$
 $2(0) + 5 = 5$

6. $(f \circ g)(-6)$
 $-\frac{27}{2}$

7. $(g \circ g)(-3)$
 63

8. $g(f(-6))$
 48

9. $(h \circ f)(5)$
 8

10. $(h \circ h)(\frac{1}{2})$
 17

Given: $f(x) = 2x - 5$ $g(x) = 3x^2$ $h(x) = \frac{3x-1}{2}$ $k(x) = x^2 - 3x + 2$

Find the following:

11. $f(-4)$

-13

😊 12. $(f \circ g)(-1)$

1

13. $(g+k)(2)$

$g(2) = 3(2)^2$ $k(2) = (2)^2 - 3(2) + 2$
 $12 + 0$
 12

14. $(k-f)(3)$

1

15. $(f \cdot g)(6)$

756

😊 16. $f(g(x))$

$6x^2 - 5$

17. $\left(\frac{g}{k}\right)(0)$

0

😊 18. $(h \circ k)(-2)$

$\frac{35}{2}$ or 17.5

19. $\frac{f(1)+k(-1)}{3}$ $f(1) = -3$
 $k(-1) = 6$

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

20. $(f+k)(x)$

$x^2 - x - 3$

21. $(k \circ g)(x)$

$9x^4 - 9x^2 + 2$

22. $(h+g)(1)$

4

23. $\frac{(f-k)(0)}{2}$

$-\frac{7}{2}$

😊 24. $g(h(0))$

$\frac{3}{4}$

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

$\frac{2x-5}{3x^2} \quad x \neq 0$

26. $(g \cdot k)(x)$

$3x^4 - 9x^3 + 6x^2$

Turn in Week 2 Hw Tracker

4.5 Piecewise w/ 3 pieces (pink)

4.6 Piecewise Review (blue)

4.7 Function Combinations (yellow)

4.8 Composite Functions (green)

/40

Test Wednesday
WHITEBOARDS

Write the equation for the given function:

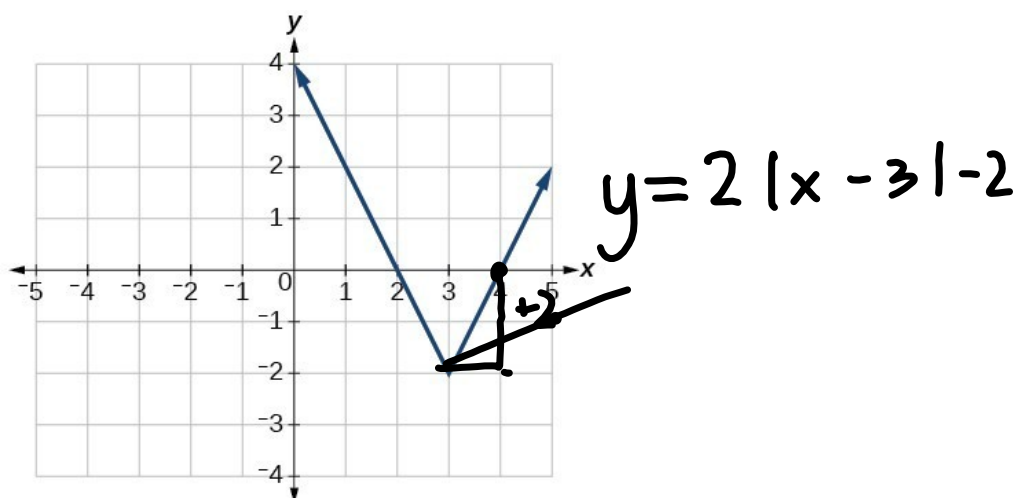
An absolute value function - $y = \frac{1}{2}|x - 3| - 7$

Shifted right 3

Shifted down 7

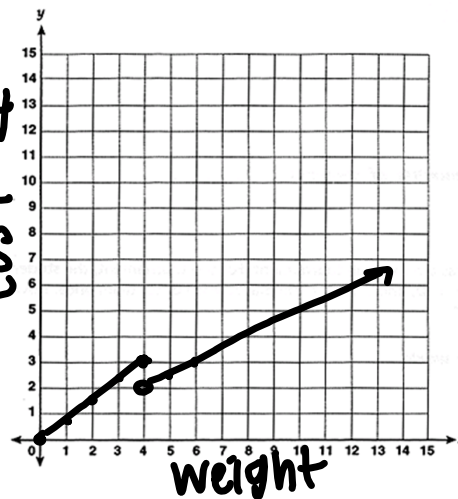
Compressed by a factor of $\frac{1}{2}$

Write the equation of the graph shown



Walmart is having a sale on oranges. They cost \$.75 per pound up to 4 pounds. If you buy over 4 pounds they cost \$.50 per pound. Express the cost as a function of weight. Write and graph the piecewise function.

$$f(x) = \begin{cases} .75x & 0 \leq x \leq 4 \\ .5x & x > 4 \end{cases}$$



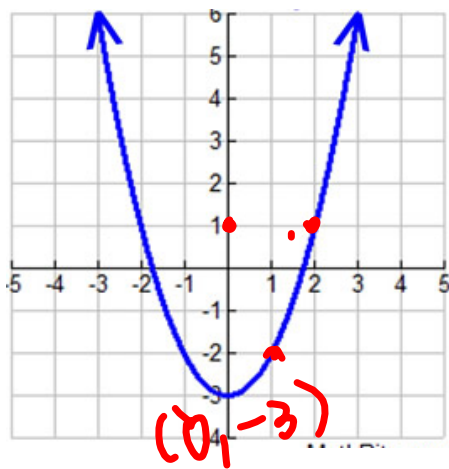
$$f(x) = \begin{cases} x^2 + 1; & x \leq -1 \\ x + 4; & -1 < x < 2 \\ 5; & x \geq 2 \end{cases}$$

Evaluate:

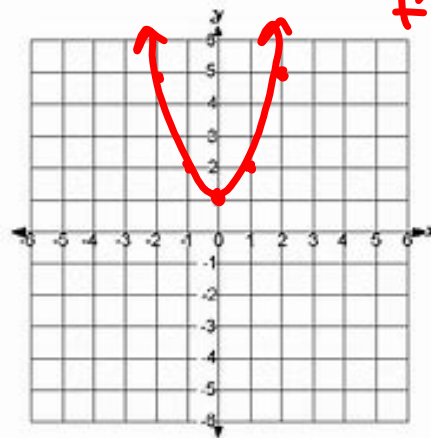
$$f(0) = 4$$

$$f(1) = 5$$

$f(x)$ is shown below.



Graph $g(x)$ if $g(x) = f(x) + 4$
 $f(x+4)$



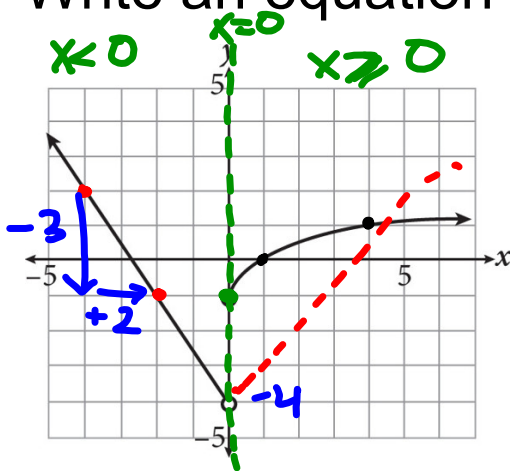
Identify the vertex of the function

$$y = a(x-h)^2 + k \quad (h, k)$$
$$f(x) = 2(x - 3)^2 - 5 \quad (3, -5)$$

3
R3 D5

$$(3, -5)$$

Write an equation for the piecewise function



$$f(x) = \begin{cases} \sqrt{x} - 1, & x \geq 0 \\ -\frac{3}{2}x - 4, & x < 0 \end{cases}$$

$$\frac{3}{2}|x| - 4, \quad x < 0$$

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

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

$$(f \cdot g)(x)$$

$$(f \cdot g)(2)$$

Standard Form:

$$(-4x + 3)(3x^2 - 5)$$

$$-12x^3 + 20x + 9x^2 - 15$$

$$-12x^3 + 9x^2 + 20x - 15$$

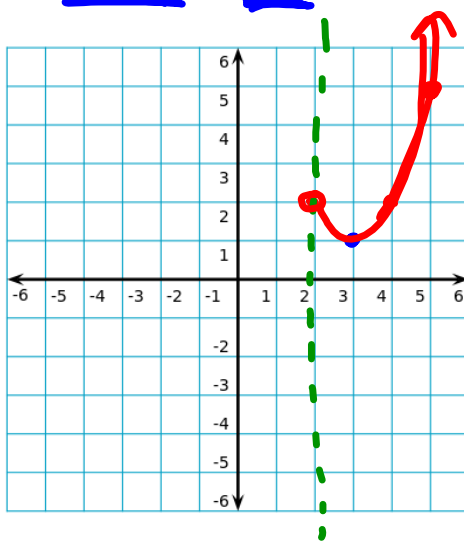
$$-12(8) + 9(4) + 20(2) - 15 = -35$$

$$-96 + 36 + 40 - 15$$

$$-60 + 40 - 15$$

$$-20 - 15 = -35$$

Graph $f(x) = (x - 3)^2 + 1$ with domain $x > 2$



$$f(x) = \underline{-4x + 3}$$

$$g(x) = \underline{3x^2 - 5}$$

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

$$(f \circ g)(1)$$

$$-4(3x^2 - 5) + 3$$

$$-12x^2 + 20 + 3 = -12x^2 + 23$$

$$-12 + 23 = 11$$

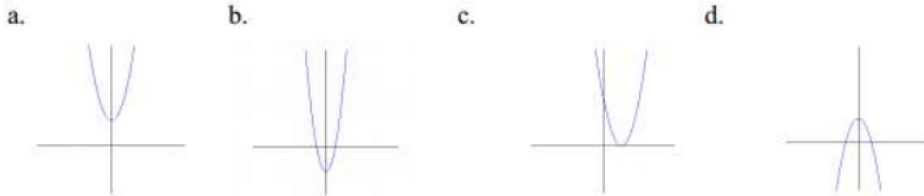
11
😊

due Wednesday

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)

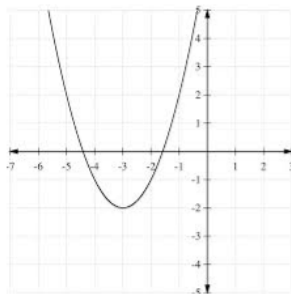
Given the parent function and a description of the transformation, write the equation of the transformed function, $f(x)$.

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

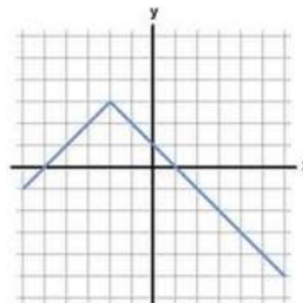
5. A quadratic function with a vertical stretch/compression by $\frac{2}{5}$, and a vertical shift down 2.

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:



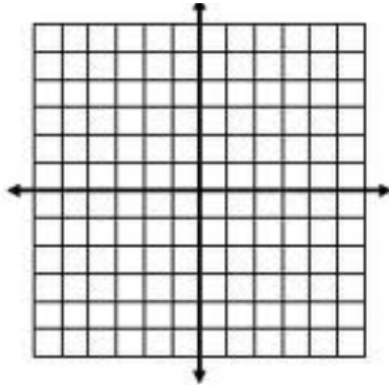
7. _____



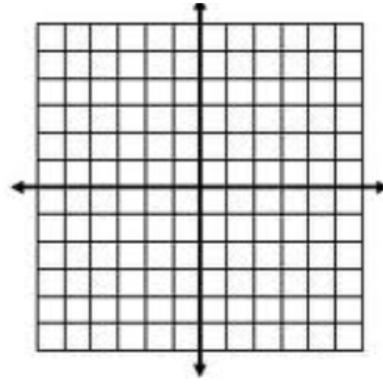
8. _____

Graph the following piecewise functions:

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



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. $f(g(x))$

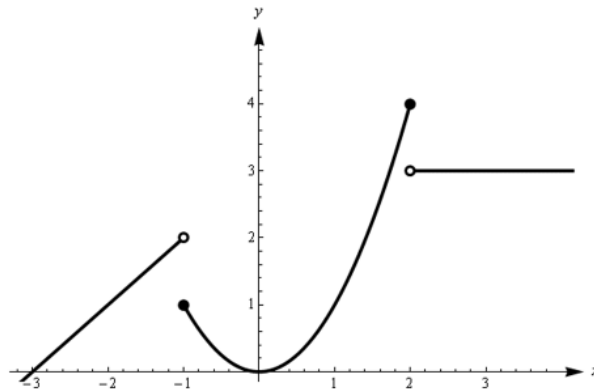
17. $(f \cdot g)(-1)$

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

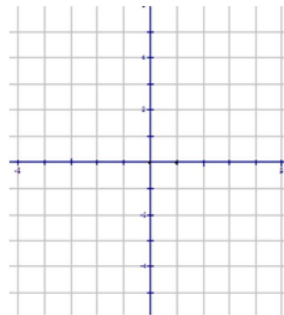
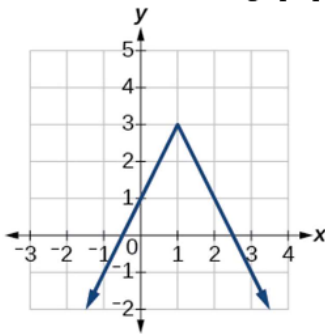
19. $(g + h)(0)$

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

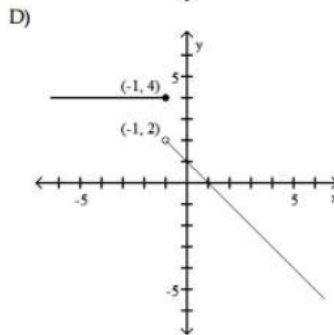
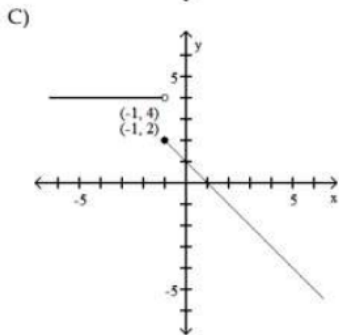
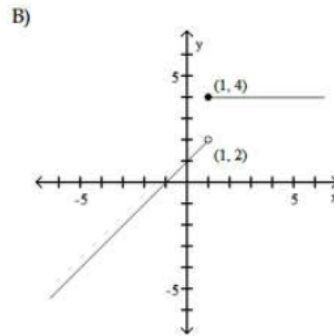
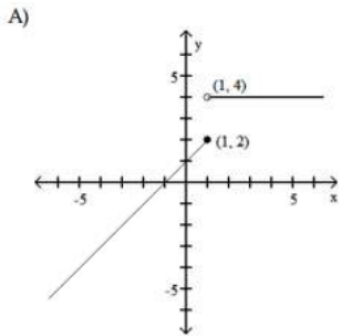
21. Write a piecewise function for the graph.



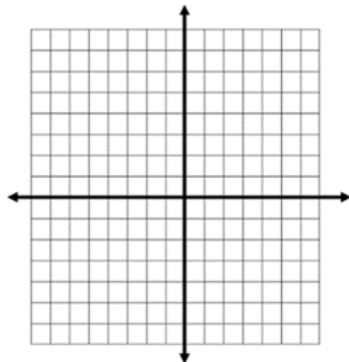
22. Let $f(x)$ be the function represented by the graph below. Perform the indicated transformation and graph the new function on the graph provided. $k(x) = -f(x - 2)$



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



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.

