

# Review

May 8, 2015 12:21 PM

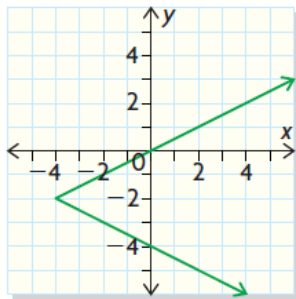
1.

For each relation, determine the domain and range and whether the relation is a function. Explain your reasoning.

a)  $\{(-3, 0), (-1, 1), (0, 1), (4, 5), (0, 6)\}$

b)  $y = 4 - x$

c)



d)  $x^2 + y^2 = 16$

2.

What rule can you use to determine, from the graph of a relation, whether the relation is a function? Graph each relation and determine which are functions.

a)  $\{(-2, 1), (1, 1), (0, 0), (1, -1), (1, -2), (2, -2)\}$

b)  $y = 4 - 3x$

c)  $y = (x - 2)^2 + 4$

e)  $y = \frac{1}{x}$

f)  $y = \sqrt{x}$

3.

Sketch the graph of a function whose domain is the set of real numbers and whose range is the set of real numbers less than or equal to 3.

4.

If  $f(x) = x^2 + 3x - 5$  and  $g(x) = 2x - 3$ , determine each.

a)  $f(-1)$

b)  $f(0)$

c)  $g\left(\frac{1}{2}\right)$

d)  $f(2b)$

e)  $g(1 - 4a)$

f)  $x$  when  $f(x) = g(x)$

5.

a) Graph the function  $f(x) = -2(x - 3)^2 + 4$ , and state its domain and range.

b) What does  $f(1)$  represent on the graph? Indicate, on the graph, how you would find  $f(1)$ .

c) Use the equation to determine each of the following.

i)  $f(3) - f(2)$

iii)  $f(1 - x)$

ii)  $2f(5) + 7$

6.

If  $f(x) = x^2 - 4x + 3$ , determine the input(s) for  $x$  whose output is  $f(x) = 8$ .

7.

A ball is thrown upward from the roof of a building 60 m tall. The ball reaches a height of 80 m above the ground after 2 s and hits the ground 6 s after being thrown.

a) Sketch a graph that shows the height of the ball as a function of time.

b) State the domain and range of the function.

c) Determine an equation for the function.

8.

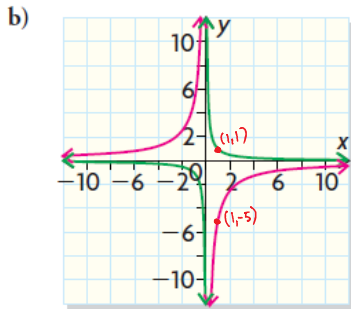
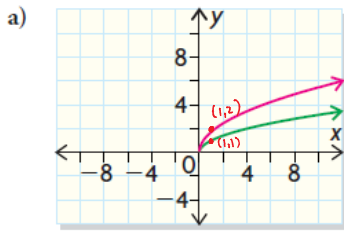
State the domain and range of each function.

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

b)  $f(x) = \sqrt{2x + 4}$

9.)

In each graph, a parent function has undergone a transformation of the form  $f(kx)$ . Determine the equations of the transformed functions graphed in red. Explain your reasoning.



10.)

For each set of functions, transform the graph of  $f(x)$  to sketch  $g(x)$  and  $h(x)$ , and state the domain and range of each function.

a)  $f(x) = x^2$ ,  $g(x) = \left(\frac{1}{2}x\right)^2$ ,  $h(x) = -(2x)^2$

b)  $f(x) = |x|$ ,  $g(x) = | -4x |$ ,  $h(x) = \left|\frac{1}{4}x\right|$

11.)

The point  $(1, 4)$  is on the graph of  $y = f(x)$ . Determine the coordinates of the image of this point on the graph of  $y = 3f[-4(x + 1)] - 2$ .

12.)

In each case, write the equation for the transformed function, sketch its graph, and state its domain and range.

a) The graph of  $f(x) = \sqrt{x}$  is compressed horizontally by the factor  $\frac{1}{2}$ , reflected in the  $x$ -axis, and translated 3 units right and 2 units down.

b) The graph of  $y = \frac{1}{x}$  is stretched vertically by the factor 3, reflected in the  $x$ -axis, and translated 4 units left and 1 unit up.

13.)

If  $f(x) = (x - 4)(x + 3)$ , determine the  $x$ -intercepts of each function.

a)  $y = f(x)$                       c)  $y = f\left(-\frac{1}{2}x\right)$

b)  $y = -2f(x)$                       d)  $y = f(-(x + 1))$

14.)

A function  $f(x)$  has domain  $\{x \in \mathbb{R} \mid x \geq -4\}$  and range  $\{y \in \mathbb{R} \mid y < -1\}$ . Determine the domain and range of each function.

a)  $y = 2f(x)$                       c)  $y = 3f(x + 1) + 4$

b)  $y = f(-x)$                       d)  $y = -2f(-x + 5) + 1$

15.)

Determine the domain and range of each function. Show your steps.

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

c)  $f(x) = -|x + 1| + 3$

b)  $f(x) = \sqrt{3 - x} - 4$

16.)

find the inverse of the given function

a)  $j(x) = (x + 4)^2 + 9$ , when  $x \leq -4$

b)  $f(x) = 3\sqrt{4 - x}$

c)  $h(x) = \frac{4x}{x - 6}$

d)  $g(x) = x^2 - 10x + 25$ , when  $x \geq 5$