

Review

May 8, 2015 12:21 PM

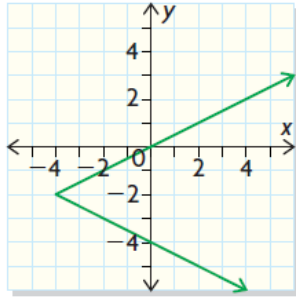
1.

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.

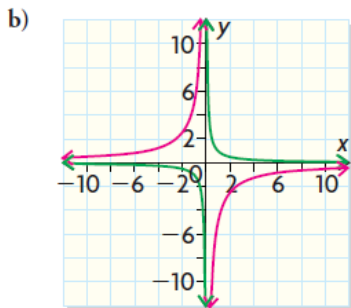
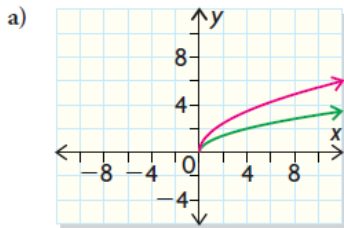
State the domain and range of each function.

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 y -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 $\{x \in \mathbf{R} \mid x \geq -4\}$ and range $\{y \in \mathbf{R} \mid y < -1\}$. 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 $x \geq 5$