

## HW 6.1 Answers

1. no; 3 repeats
2. yes
3. yes
4. no; fails the vertical line test
5. yes
6. no; circle, fails the vertical line test
7.  $h(-4) = -14$
8.  $g(-2) = -7$
9.  $f(-3) = 5/7$
10.  $k(-3) = 9$
11.  $f(n + 2) = 2n - 1$
12.  $h(n + 1) = n^2 + 2$
13.  $g(n-1) = 4n^2 - 4n + 1$
14.  $k(2n + 1) = -6n - 1$

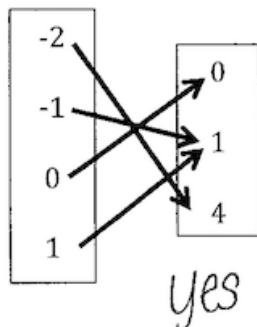
In 1 - 4, determine if the relation is a function. If it is not, explain why it is not a function.

1.  $\{(3, 2), (-9, 0), (3, -3), (1, -2)\}$

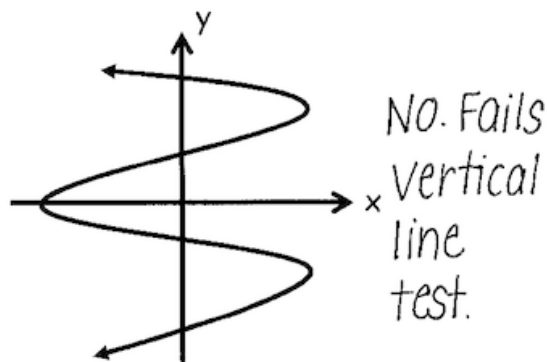
No. 3 repeats

2.  $y = x^3 - 1$

3.



4.



5.  $y = |x - 2| + 1$

yes

6.  $(x - 1)^2 + (y + 4)^2 = 9$

No. Circle.  
Fails vertical line test

Evaluate each of the following:

7.  $h(x) = 3x - 2$ , find  $h(-4)$

$$h(-4) = 3(-4) - 2$$

$$h(-4) = -14$$

8.  $g(x) = -x^2 - 3$ , find  $g(-2)$

$$\begin{aligned} g(-2) &= -(-2)^2 - 3 \\ &= -4 - 3 \\ &= -7 \end{aligned}$$

9.  $f(x) = \frac{2x+1}{3x+2}$ , find  $f(-3)$

$$f(-3) = \frac{2(-3)+1}{3(-3)+2}$$

$$f(-3) = \frac{5}{7}$$

10.  $k(x) = 2\sqrt{1-x} + 5$ , find  $k(-3)$

$$k(-3) = 2\sqrt{1+3} + 5$$

$$k(-3) = 2(2) + 5$$

$$k(-3) = 9$$

11.  $f(x) = 2x - 5$ , find  $f(n + 2)$

$$f(n+2) = 2(n+2) - 5$$

$$f(n+2) = 2n - 1$$

12.  $h(x) = (x - 1)^2 + 2$ , find  $h(n + 1)$

$$h(n+1) = (n+1-1)^2 + 2$$

$$h(n+1) = n^2 + 2$$

13.  $g(x) = (2x + 1)^2$ , find  $g(n - 1)$

$$g(n-1) = (2(n-1) + 1)^2$$

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

$$g(n-1) = 2n(2n-1) - 1(2n-1)$$

$$g(n-1) = 4n^2 - 2n - 2n + 1$$

$$g(n-1) = 4n^2 - 4n + 1$$

14.  $k(x) = 2 - 3x$ , find  $k(2n + 1)$

$$k(2n+1) = 2 - 3(2n+1)$$

$$k(2n+1) = -6n - 1$$

Unit 6

Day 2

# Domain & Range

Warm—Up:  $f(x) = -x^2 + 3x$  find  $f(2x - 1)$

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

Aside:

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

$$(2x-1)(2x-1)$$

$$2x(2x-1) - 1(2x-1)$$

$$4x^2 - 4x + 1$$

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

$$f(2x-1) = -4x^2 + 10x - 4$$

Domain - The domain of a function is the set of all x-values (inputs), independent variable

Range - The range of a function is the set of all y-values (outputs), dependent variable

For the following relations, state the domain and range.

Determine (yes or no) if the relation is a function.

1.  $\{(3, 2), (5, 7), (1, 4), (9, 2), (3, 7)\}$

Domain:  $\{1, 3, 5, 9\}$

Range:  $\{2, 4, 7\}$

Function? No

2.  $\{(6, 2), (3, 5), (9, 0), (5, 7), (8, 5)\}$

Domain:  $\{3, 5, 6, 8, 9\}$

Range:  $\{0, 2, 5, 7\}$

Function? Yes

3.  $\{(1, 1), (2, 3), (3, 4), (4, 2), (5, 1)\}$

Domain:  $\{1, 2, 3, 4, 5\}$   ~~$\neq [1, 5]$~~

Range:  $\{1, 2, 3, 4\}$

Function? Yes

4.  $\{(6, 1), (9, 2), (6, 8), (9, 7), (-8, 3)\}$

Domain:  $\{-8, 6, 9\}$

Range:  $\{1, 2, 3, 7, 8\}$

Function? No

Two Types of Notation: Set-Builder and Interval

Given the number line graph:



Set-Builder  $\rightarrow \{x | -2 \leq x < 7\}$

Read: The set of all  $x$  such that  $-2$  is less than or equal to  $x$  and  $x$  is less than  $7$

Interval Notation  $\rightarrow$  Parentheses and/or brackets are used to show whether the endpoints are excluded or included. For example,

~~$[2, 7)$~~  is the interval of real numbers between  $2$  and  $7$ , including  $2$  and excluding  $7$ .

$[-2, 7)$

Interval Notation

$$[-3, 4)$$

$$(-1, 5]$$

$$(-\infty, 2) \text{ or } (4, \infty)$$

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

Set-Builder Notation

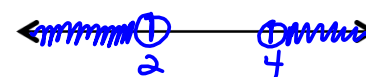
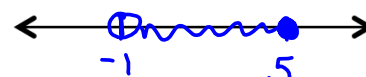
$$\{x \mid -3 \leq x < 4\}$$

$$\{x \mid -1 < x \leq 5\}$$

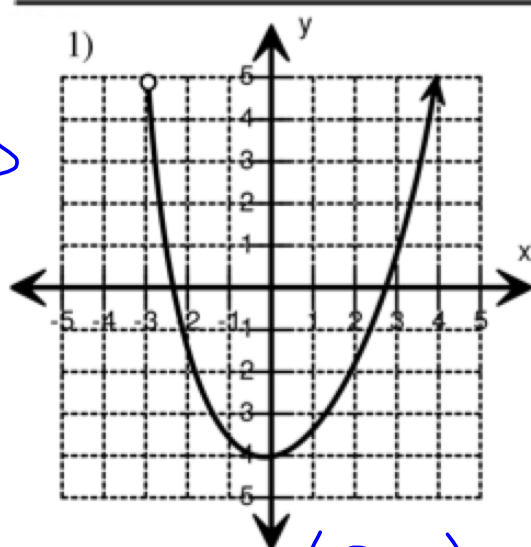
$$\{x \mid x < 2 \text{ or } x > 4\}$$

$$\{x \mid x \in \mathbb{R}\}$$

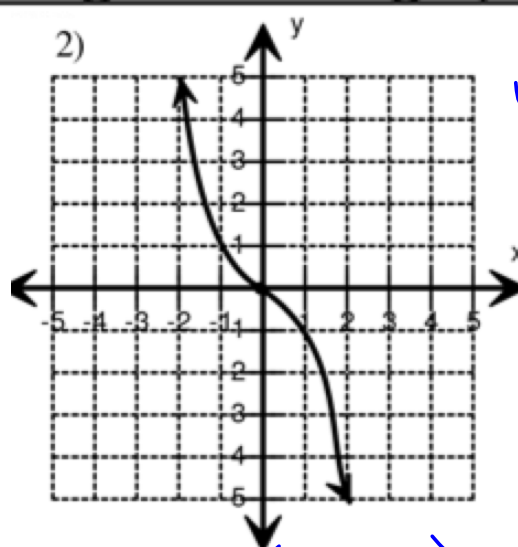
Number Line Graph



Find the Domain and Range for each graph.



Domain :  $(-3, \infty)$   
Range :  $[-4, \infty)$



Domain :  $(-\infty, \infty)$   
Range :  $(-\infty, \infty)$

