WORKSHEET #1 - Writing Domain and range in set/interval notation & Discrete

Answers for the domain and range may be written as a set notation (inequality), or they may be written in interval notation. This worksheet will help you do both.

Use the following as rules for writing interval notation:

    1) Always use parentheses around ∞ and $-\infty$.
    2) If a value is in the domain or range, then use a bracket around that value.
    3) If a value is not in the domain or range, use parentheses around that value.

For example, the following set notation are written in interval notation:

$-3 < x < 7$ $(-3, 7)$
$-4 \le x \le 10$ $[-4, 10]$
$3 < y \le 15$ $(3, 15]$
$-7 \le y < 8$ $[-7, 8)$
$x < 4$ $(-\infty, 4)$
$y > 2$ $(2, \infty)$
$x \le -4$ $(-\infty, -4]$
$y \ge -5$ $[-5, \infty)$

Part A:
Practice: Write the given set notation in interval notation:

1. $-3 \le x < 2$ _____   2. $-6 < y < 12$ _____

3. $x \ge 7$ _____   4. $y < 4$ _____

<u>Domain and range:</u>
The domain represents the values of x that are inputs for the function.
The range represents the values of y that are outputs for the function.

Example: Given the graph, write the domain and the range of the function as set notation and in interval notation. Note: the endpoints of the line segment are (-1,-1) and (5, 2)
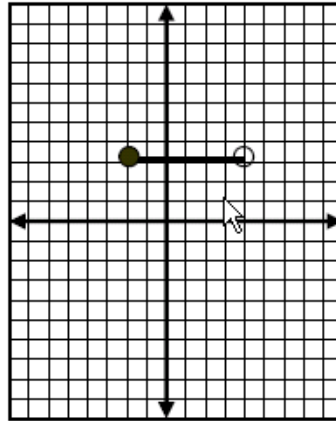Since the function is continuous, the x-values are between -1 and 5, and the y-values are between -1 and 2.

  Set Notation   Interval
  $-1 \le x \le 5$ $[-1, 5]$
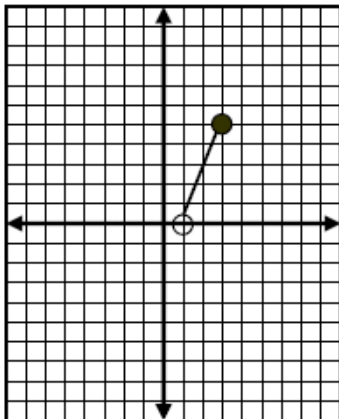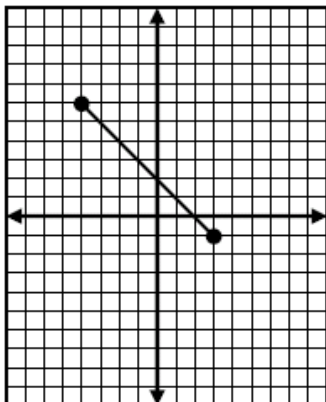 $-1 \le y \le 2$ $[-1, 2]$
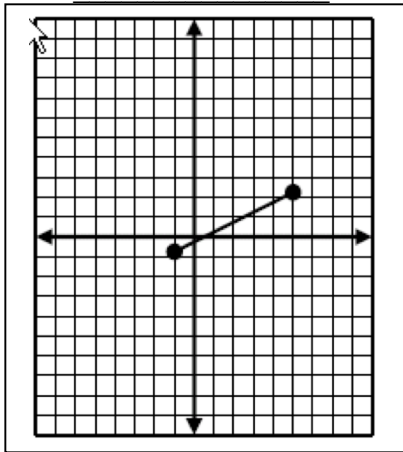
5. Domain as Set Notation: _____
             Interval:_____
    Range as Set Notation:_____
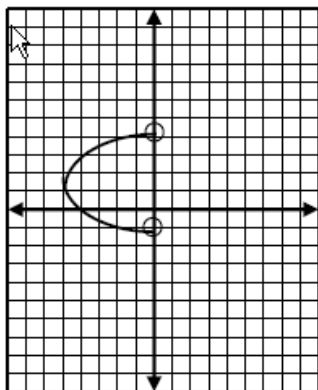   Interval:_____

6. Domain as Set Notation: _____   Interval:_____
    Range as Set Notation:_____   Interval:_____
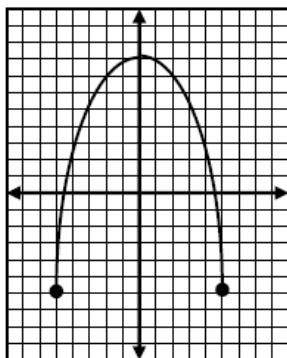

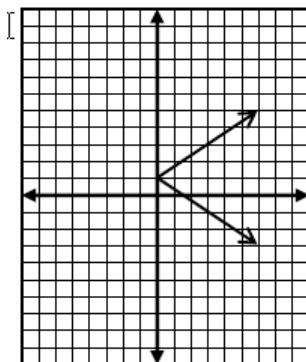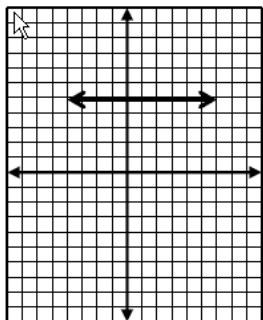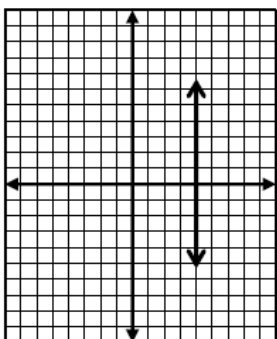7. Domain as Set Notation: _____   Interval:_____
    Range as Set Notation:_____   Interval:_____

8. Domain as Set Notation: _____   Interval:_____
   Range as Set Notation:_____   Interval:_____

9. Domain as Set Notation: _____   Interval:_____
   Range as Set Notation:_____   Interval:_____

10. Domain as Set Notation: _____   Interval:_____
   Range as Set Notation:_____   Interval:_____

11. Domain as Set Notation: _____   Interval:_____
    Range as Set Notation:_____   Interval:_____

12. Domain as Set Notation: _____   Interval:_____
    Range as Set Notation:_____   Interval:_____

13. Domain as Set Notation: _____   Interval:_____
    Range as Set Notation:_____   Interval:_____
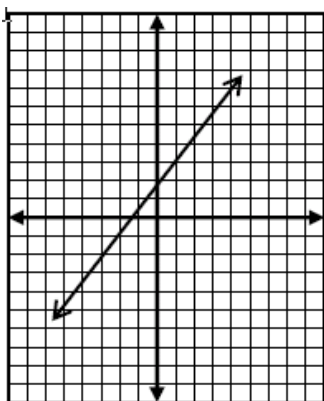
**Discrete** are functions that are **not continuous.** (just a bunch of dots**)**

Example: Given the graph, write the domain and the range of the function in discrete notation.
Note: you look at each point-coordinate on the graph and the *x-coordinate* is your domain and
your *y-coordinate*. For the domain start with point furthest to the left and work your way to the point
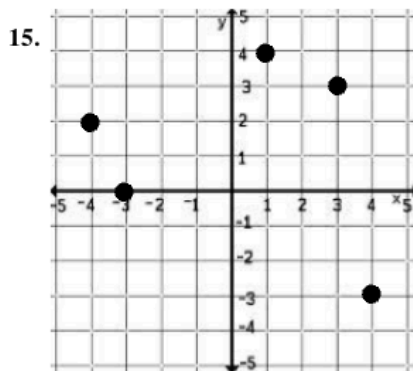furthest right. For the range start will the lowest point and work your way to the highest point.
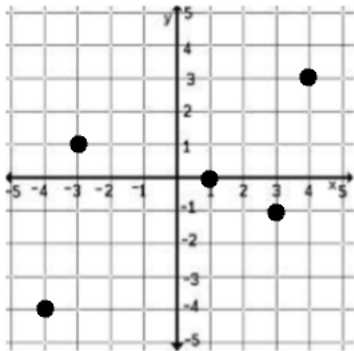
Domain: **-4, -3, 1, 3, 4**

Range: **-4, -1, 0, 1, 3**
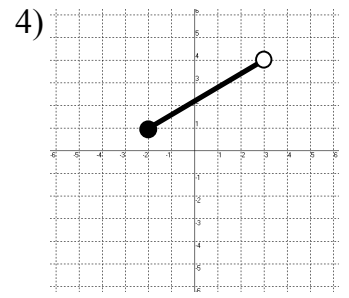
Exercise
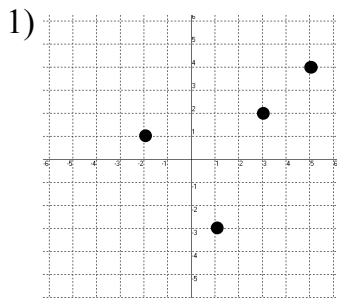
14.

Domain: _____

Range: _____

15.

Domain: _____

Range: _____

16.
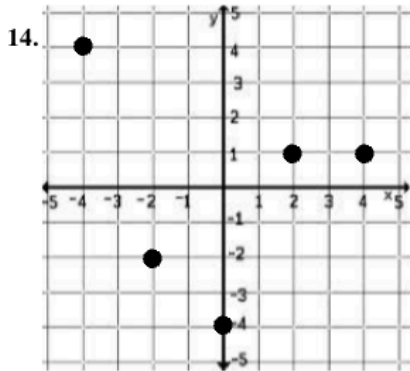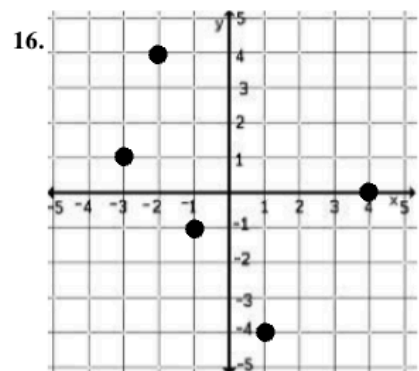
Domain: _____

Range: _____

Part B: Give the domain and range of each. Tell if it is a function.

1)

2)

3)

4)

5)

6)

7)

8)

9)

10)

11)

12)

13,

14,

15)

16)
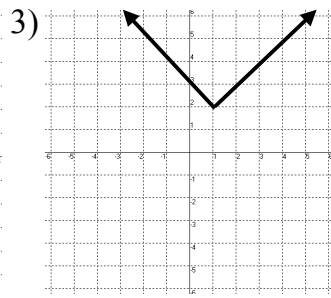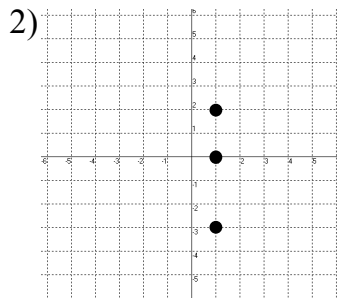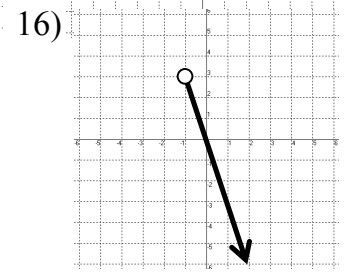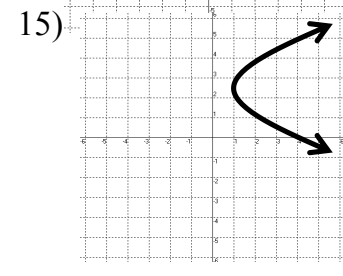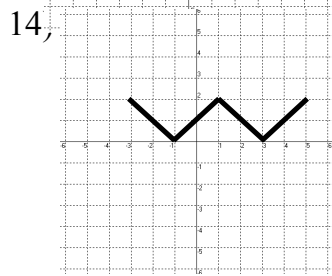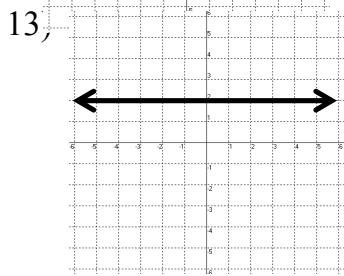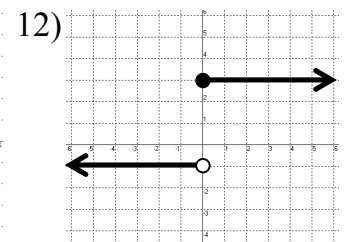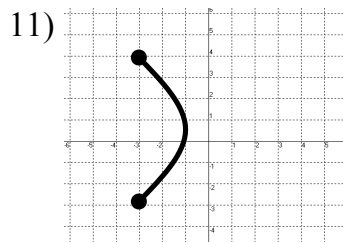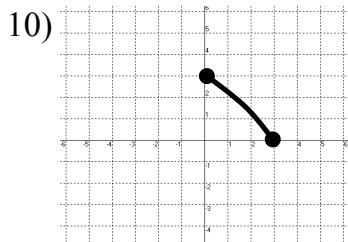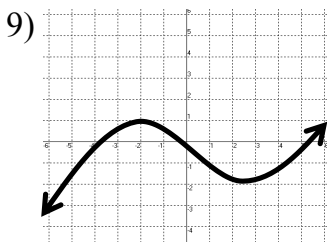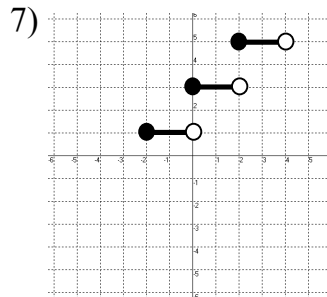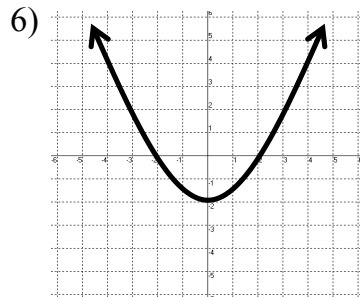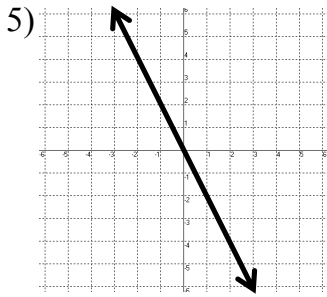
Give the domain and range of each. Tell if it is a function.

17) {(5, 2), (–3, 1), (5, –4), (0, 11)}   18) {(–6, –8), (5, 1), (9, –4), (7, 1), (15, 0)}

List the ordered pairs of each relation. Is the relation a function?
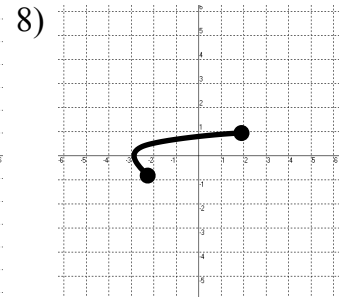
19.

<u>D</u>   <u>R</u>

-8   -4
-3   -3
0   1
3   5

Answers for Part B:

1. $D=\{-2, 1, 3, 5\}$
   $R=\{-3, 1, 2, 4\}$
   Yes

2. $D=\{1\}$
   $R=\{-3, 0, 2\}$
   No

3. $D=\{\text{all reals}\}$
   $R=\{y\geq 2\}$
   Yes

4. $D=\{-2\leq x<3\}$
   $R=\{1\leq y<4\}$
   Yes

5. $D=\{\text{all reals}\}$
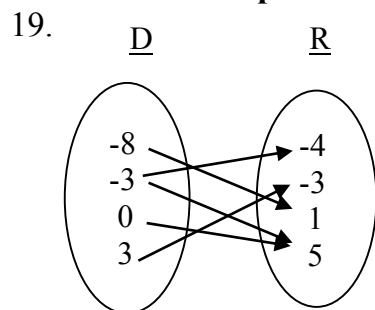 $R=\{\text{all reals}\}$
   yes

6. $D=\{\text{all reals}\}$
   $R=\{y\geq -2\}$
   yes

7. $D=\{-2\leq x<4\}$
   $R=\{1, 3, 5\}$
   Yes

8. $D=\{-3\leq x\leq 2\}$
   $R=\{-1\leq y\leq 1\}$
   no

9. $D=\{\text{all reals}\}$
   $R=\{\text{all reals}\}$
   yes

10. $D=\{0\leq x\leq 3\}$
    $R=\{0\leq y\leq 3\}$
    Yes

11. $D=\{-3\leq x\leq -1\}$
    $R=\{-3\leq y\leq 4\}$
    no

12. $D=\{\text{all reals}\}$
    $R=\{-1, 3\}$
    yes

13. $D=\{\text{all reals}\}$
    $R=\{2\}$
    Yes

14. $D=\{-3\leq x\leq 5\}$
    $R=\{0\leq y\leq 2\}$
    yes

15. $D=\{x\geq 1\}$
    $R=\{\text{all reals}\}$
    no

16. $D=\{x>-1\}$
    $R=\{y<3\}$
    yes

17. $D=\{-3, 0, 5\}$
    $R = \{-4, 1, 2, 11\}$
    no

18. $D=\{-6, 5, 7, 9, 15\}$
    $R=\{-8, -4, 0, 1\}$
    yes

19. $\{(-8, 1), (-3, -4), (-3, 5), (0, 5), (3, -3)\}$