

1. What is the **domain** and **range** of the function described by the set of points: $\{(3,5), (2,6), (-5,3), (-7,1), (2,6)\}$

DOMAIN: $\{-7, -5, 2, 3\}$

RANGE: $\{1, 3, 5, 6\}$

2. Given $f(x) = \frac{1}{2}x + 6$ and its **domain** is described by the set $\{6, -8, 4, 2\}$ what is the range?

$$f(6) = \frac{1}{2}(6) + 6 = 3 + 6 = 9$$

$$f(-8) = \frac{1}{2}(-8) + 6 = -4 + 6 = 2$$

$$f(4) = \frac{1}{2}(4) + 6 = 2 + 6 = 8$$

$$f(2) = \frac{1}{2}(2) + 6 = 1 + 6 = 7$$

RANGE: $\{2, 7, 8, 9\}$

3. Given $f(x) = 2x - 1$ and its **range** is described by the set $\{5, -3, 1, 9\}$ what is the domain?

$$\begin{array}{r} 2x - 1 = 5 \\ +1 \quad +1 \\ \hline 2x = 6 \\ \hline x = 3 \end{array}$$

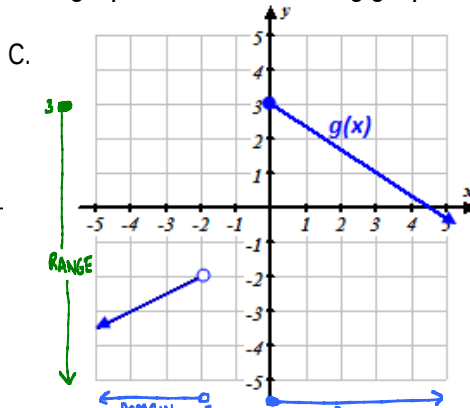
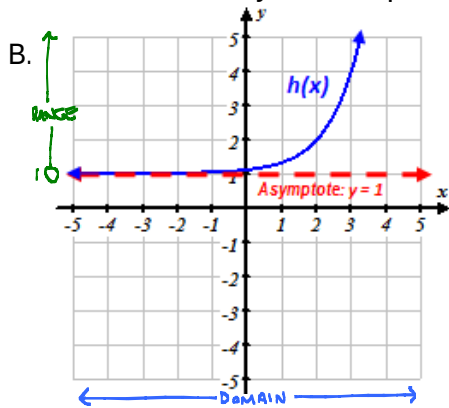
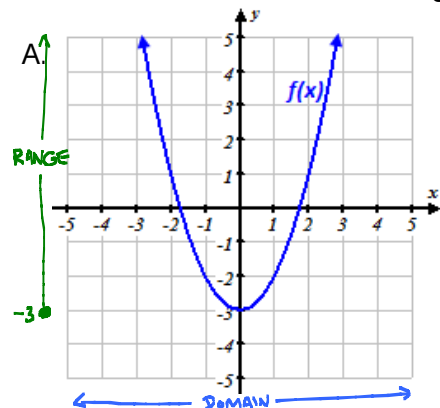
$$\begin{array}{r} 2x - 1 = -3 \\ +1 \quad +1 \\ \hline 2x = -2 \\ \hline x = -1 \end{array}$$

$$\begin{array}{r} 2x - 1 = 1 \\ +1 \quad +1 \\ \hline 2x = 2 \\ \hline x = 1 \end{array}$$

$$\begin{array}{r} 2x - 1 = 9 \\ +1 \quad +1 \\ \hline 2x = 10 \\ \hline x = 5 \end{array}$$

DOMAIN: $\{-1, 1, 3, 5\}$

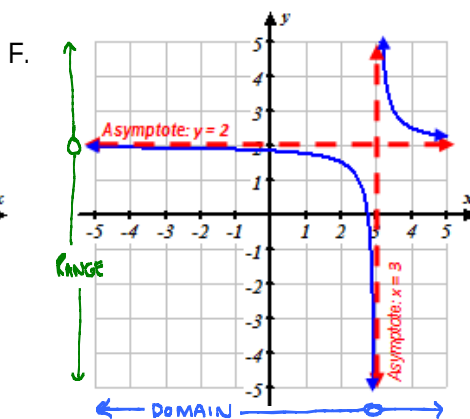
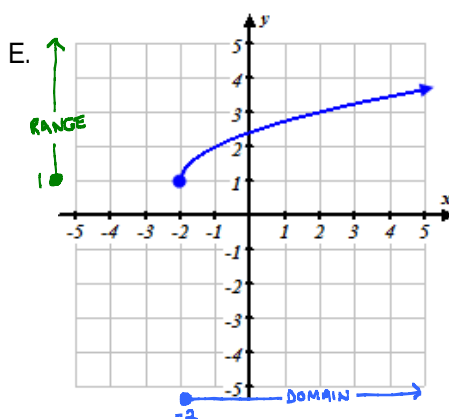
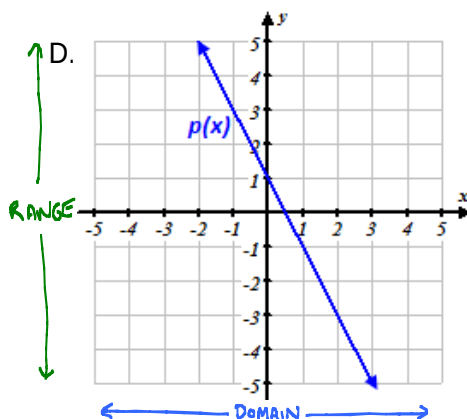
4. Describe the **domain** and **range** and label the x and y – intercepts on the graphs of the following graphed functions:



LEFT & RIGHT → Domain: ALL REALS ($\mathbb{R}$) ← SET NOT.
 $(-\infty, \infty)$ ← INTERVAL NOT.
 DOWN & UP → Range: $y \geq -3$ ← SET NOTATION
 $[-3, \infty)$ ← INTERVAL NOT.

Domain: ALL REALS ($\mathbb{R}$) ← SET
 $(-\infty, \infty)$ ← INTERVAL
 Range: $y > 1$ ← SET
 $(1, \infty)$ ← INTERVAL

Domain: $x < -2$ OR $x \geq 0$ ← SET NOTATION
 $(-\infty, -2) \cup [0, \infty)$ ← INTERVAL NOT.
 Range: $y \leq 3$ ← SET NOTATION
 $(-\infty, 3]$ ← INTERVAL NOT.



LEFT & RIGHT → Domain: ALL REALS ($\mathbb{R}$)
 $(-\infty, \infty)$
 DOWN & UP → Range: ALL REALS ($\mathbb{R}$)
 $(-\infty, \infty)$

Domain: $x \geq -2$
 $[-2, \infty)$
 Range: $y \geq 1$
 $[1, \infty)$

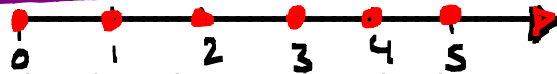
↑ SET NOTATION
 ↑ INTERVAL NOTATION

Domain: $x < 3$ OR $x > 3$
 $(-\infty, 3) \cup (3, \infty)$
 Range: $y < 2$ OR $y > 2$
 $(-\infty, 2) \cup (2, \infty)$

$x \neq 3$
 $y \neq 2$

5. Determine which of the following variables are **DISCRETE** and which are **CONTINUOUS**.

a. The variable x represents the number of friends a person has on their Facebook account.



5a. circle one:

DISCRETE CONTINUOUS

b. The variable x represents the number of questions a student missed on a test.



5b. circle one:

DISCRETE CONTINUOUS

c. The variable x represents the amount of time it takes a student to complete the test.



5c. circle one:

DISCRETE **CONTINUOUS**

d. The variable x represents the height of a student.



5d. circle one:

DISCRETE **CONTINUOUS**

e. The variable x represents the value of the money each student has with them in class.



5e. circle one:

DISCRETE CONTINUOUS

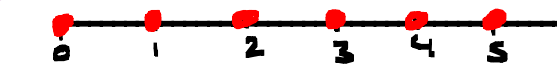
f. The variable x represents the weight of a package sent at the post office.



5f. circle one:

DISCRETE **CONTINUOUS**

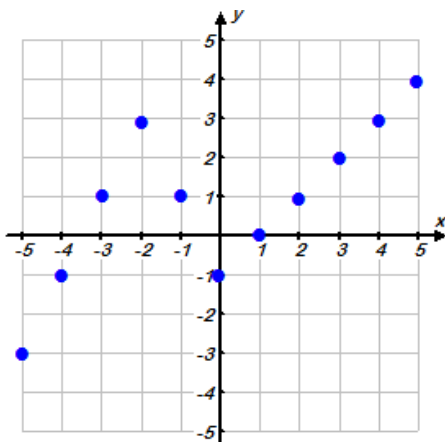
g. The variable x represents the number of packages delivered at a post office on a given day.



5g. circle one:

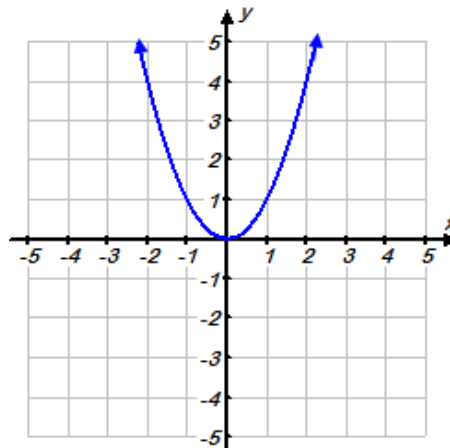
DISCRETE CONTINUOUS

6. Describe the domain and range of each function below as **DISCRETE** or **CONTINUOUS**



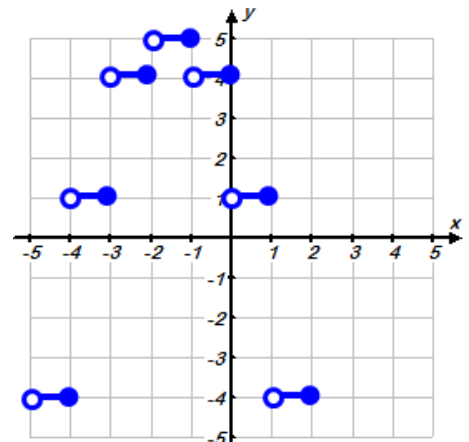
Domain: **DISCRETE**

Range: **DISCRETE**



Domain: **CONTINUOUS**

Range: **CONTINUOUS**



Domain: **CONTINUOUS**

Range: **DISCRETE**

7. Find the x and y -intercepts of the following functions.

A. $f(x) = \frac{1}{2}x + 6$

X-INT ($y=0$)
 $2 \cdot [0] = [\frac{1}{2}x + 6] \cdot 2$
 $0 = x + 12$
 $-12 = x$

Y-INT ($x=0$)
 $f(0) = \frac{1}{2}(0) + 6$
 $f(0) = 0 + 6$
 $f(0) = 6$

x-intercept: **-12** y-intercept: **6**

B. $g(x) = 3^x - 9$

X-INT ($y=0$)
 $0 = 3^x - 9$
 $+9 \quad +9$
 $9 = 3^x$
 $x = 2$

Y-INT ($x=0$)
 $g(0) = 3^0 - 9$
 $g(0) = 1 - 9$
 $g(0) = -8$

x-intercept: **2** y-intercept: **-8**

C.

x	0	2	4	6	8	10	12	14
$h(x)$	7	6	5	4	3	2	1	0

assume $h(x)$ is continuous and has a domain of all real numbers

X-INT ($y=0$)
 $(14, 0)$

Y-INT ($x=0$)
 $h(0) = 7$

x-intercept: **14** y-intercept: **7**



8. A postal company delivers packages based on their weight but will not ship anything over 50 pounds. The company charges \$0.50 per pound to deliver the package anywhere in the United States. If we consider this situation a function where the number of pounds, x , is the independent variable and the cost in dollars, y , is the dependent variable determine the domain and range.

$$f(x) = 0.50x$$

$$\text{MIN} \rightarrow f(0) = 0.50(0)$$

$$\text{MAX} \rightarrow f(50) = 0.50(50) = 25.0$$

Domain: $0 < x \leq 50$ ← CONTINUOUS

Range: $0 < y \leq 25$ ← DISCRETE

* THE AMOUNT CHARGED WOULD BE DISCRETE SINCE IT WOULD PROBABLY BE ROUNDED TO THE NEAREST CENT.

9. A limousine company rents their limousine by the hour. The company charges \$85 per hour. The minimum time is 2 hours and a maximum of 12 hours. If we consider this situation a function where the number of hours, x , is the independent variable and the cost in dollars of renting the limousine, y , is the dependent variable determine the domain and range.

$$f(x) = 85x$$

$$\text{MIN} \rightarrow f(2) = 85(2) = 170$$

$$\text{MAX} \rightarrow f(12) = 85(12) = 1020$$

Domain: $2 \leq x \leq 12$ ← CONTINUOUS

Range: $170 \leq y \leq 1020$ ← DISCRETE

* THE AMOUNT CHARGED WOULD BE DISCRETE SINCE IT WOULD PROBABLY BE ROUNDED TO THE NEAREST CENT.



10. A student is growing a bean plant outside for a science project. The plants grow for 12 weeks before reaching their maximum height. The student consider the week she started growing the plant to be week 0 and then realized that the plant closely followed the function model $h(x) = 1.5 \cdot (1.2)^x$, where x represents the number of weeks grown and $h(x)$ represents the height of the plant in inches. Using the function model describe the appropriate domain and range.

$$h(x) = 1.5(1.2)^x$$

$$\text{MIN} \rightarrow h(0) = 1.5(1.2)^0 = 1.5$$

$$\text{MAX} \rightarrow h(12) = 1.5(1.2)^{12} =$$

Domain: $0 \leq x \leq 12$ ← CONTINUOUS

Range: $1.5 \leq y \leq 13.37$ ← CONTINUOUS

11. A vending company realized a relationship between the number of people present at the stadium during a Braves game and the number of hot dogs they sold. The minimum attendance due to players and support staff is 361 people and the maximum people that could be at the stadium is 86,436 people. The relationship that describes the number of hot dogs sold very closely followed the function model $h(x) = 15 \cdot \sqrt{x}$ where x represents the number of people at the stadium and $h(x)$ represents the number of hot dogs sold. What is the domain and range of the model?



$$h(x) = 15 \cdot \sqrt{x}$$

$$\text{MIN} \rightarrow h(361) = 15 \cdot \sqrt{361} = 285$$

$$\text{MAX} \rightarrow h(86436) = 15 \sqrt{86436} = 4410$$

Domain: $361 \leq x \leq 86436$ ← DISCRETE

Range: $285 \leq y \leq 4410$ ← DISCRETE

12. An author is selling autographed copies of his book at a stand in a bookstore in the mall and charging \$12 per copy. The author brought a total of 40 books with him to sell at his stand. If the function $p(x) = 12x$ represents the gross profit the author could make during the time he is sitting at the stand, determine the appropriate domain and range.

DOMAIN (x): # OF BOOKS SOLD RANGE (y): MONEY MADE

$$p(x) = 12x$$

$$\text{MIN} \quad p(0) = 12(0) = 0$$

$$\text{MAX} \quad p(40) = 12(40) = 480$$

Domain: $0 \leq x \leq 40$ ← DISCRETE

Range: $0 \leq y \leq 480$ ← DISCRETE

* THE AMOUNT CHARGED WOULD BE DISCRETE SINCE IT WOULD PROBABLY BE ROUNDED TO THE NEAREST CENT.

