

Are there any Assigned Practice Questions you would like to see on the board?

p. 536 #1, 2

p. 543 # 1bcd, 2bd, 3abc, 4

(Copy of sheet on next screen)

p. 536

1. Find the value of each expression for $x = -5$ and $y = -4$.

a) $-4x - 2y$ b) $-3x - 2y^2$ c) $(3x - 4y)^2$ d) $\left(\frac{x}{y}\right) - \left(\frac{y}{x}\right)$

2. If $x = -\frac{1}{2}$ and $y = \frac{2}{3}$, find the value of each expression.

a) $x + y$ b) $x + 2y$ c) $3x - 2y$ d) $\frac{1}{2}x - \frac{1}{2}y$

p. 543

1. Simplify.

- a) $3x + 2y - 5x - 7y$
 b) $5x^2 - 4x^3 + 6x^2$
 c) $(4x - 5y) - (6x + 3y) - (7x + 2y)$
 d) $m^2n + p - (2p - 3m^2n)$

3. Expand and simplify.

- a) $3x(x + 2) + 5x(x - 2)$
 b) $-7h(2h + 5) - 4h(5h - 3)$
 c) $2m^2n(m^3 - n) - 5m^2n(3m^3 + 4n)$
 d) $-3xy^3(5x + 2y + 1) + 2xy^3(-3y - 2 + 7x)$

2. Expand.

- a) $3(2x + 5y - 2)$
 b) $5x(x^2 - x + y)$
 c) $m^2(3m^2 - 2n)$
 d) $x^5y^3(4x^2y^4 - 2xy^5)$

4. Expand and simplify.

- a) $(3x - 2)(4x + 5)$
 b) $(7 - 3y)(2 + 4y)$
 c) $(5x - 7y)(4x + y)$
 d) $(3x^3 - 4y^2)(5x^3 + 2y^2)$

Today's Learning Goal(s):

By the end of the class, I will be able to:

- a) Determine if a relation is a function (or not) given a mapping notation.
- b) Determine if a relation is a function (or not) given a graph.

MCF 3MI

1.0 & 1.1 Characteristics of a Function

Date: Feb. 7/20
(Every lesson)

Review:

Ex.1: Identify which of the following are linear or quadratic:

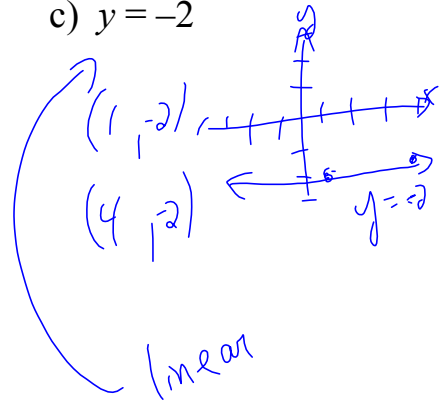
a) $y = 5x + 2$

$y = mx + b$
linear

b) $y = 2x^2 - 3$

quadratic

c) $y = -2$

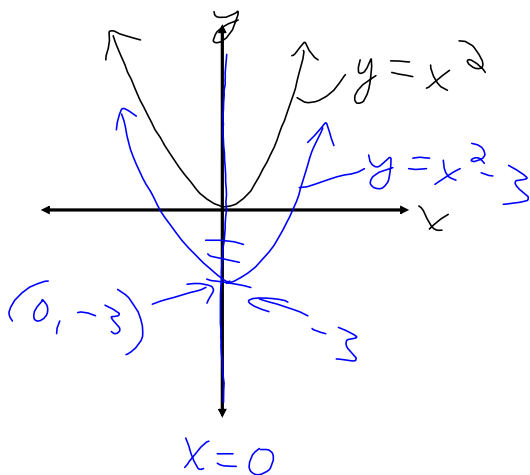


A of S:

Ex.2: For each relation, determine the y-intercept and the axis of symmetry.

a) $y = x^2 - 3$

let $x=0$ $y = (0)^2 - 3$
 $= -3$

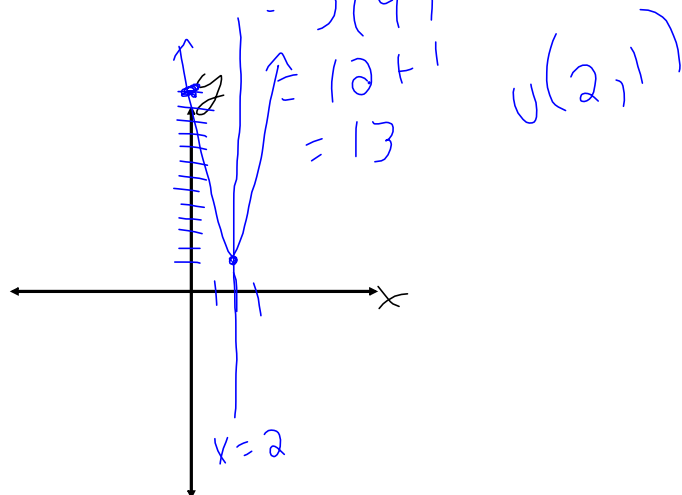


↳ let $x=0$

b) $y = 3(x - 2)^2 + 1$

↳ let $x=0$

$y = 3(0 - 2)^2 + 1$
 $= 3(-2)^2 + 1$
 $= 3(4) + 1$
 $= 12 + 1$
 $= 13$



Domain and range describe all the possible values of the relation.

Domain describes ALL of the x -values.

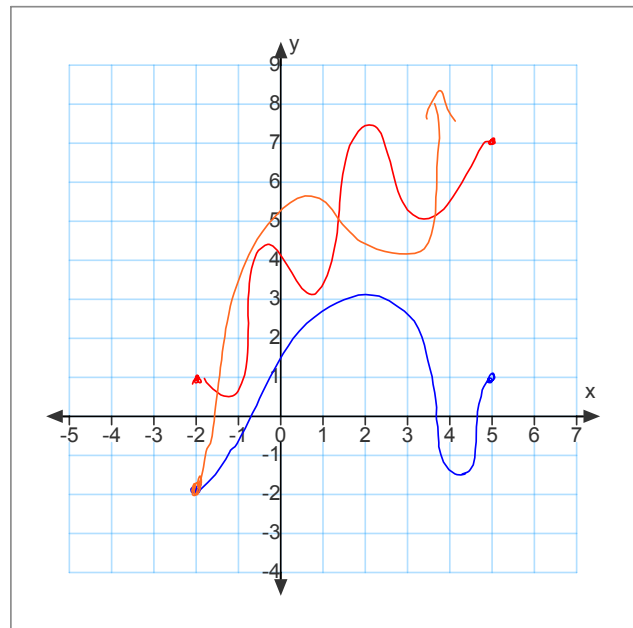
Range describes ALL of the y -values.

We use set notation to mathematically write the domain & range.

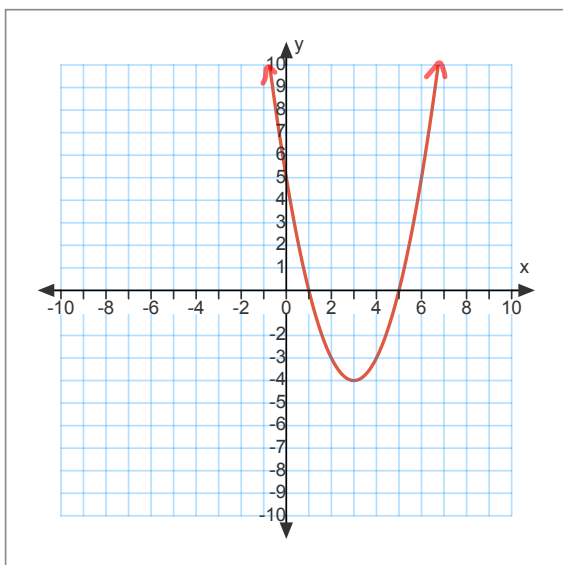
For example:

$$D = \{x \in \mathbb{R} \mid -2 \leq x \leq 5\}$$

$$R = \{y \in \mathbb{R} \mid y \geq -2\}$$



Ex.3: State the domain and range of the quadratic function below:



$$D: \{x \in \mathbb{R}\}$$

$$R: \{y \in \mathbb{R} \mid y \geq -4\}$$

A function is a relation that has a one-to-one relationship. This means that for every x -value there is only one y -value.

Ex.4: For each of the following relations, determine the domain & range, then state whether or not it is a function.

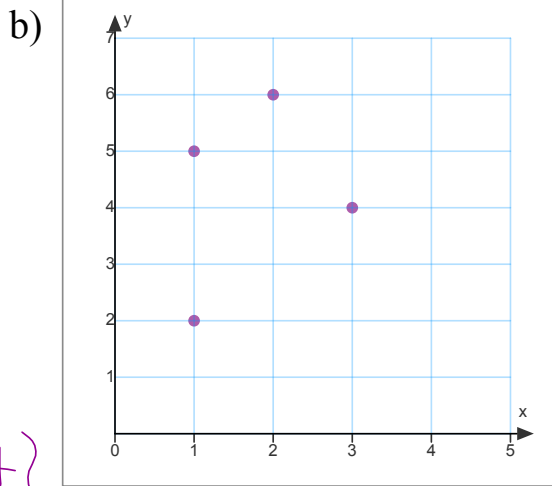
a)

x	y
-1	-3
0	1
1	5
2	9

D: $\{-1, 0, 1, 2\}$

R: $\{-3, 1, 5, 9\}$

Function $\{x \text{ does not repeat}\}$



D: $\{1, 2, 3\}$

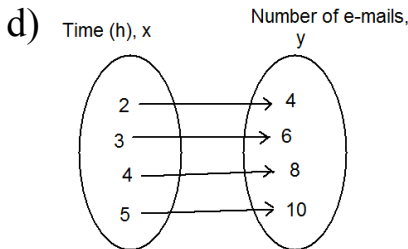
R: $\{2, 4, 5, 6\}$

NOT a function
 $x=1$ repeats

c) $G:(x, y) = \{\text{number of golfers, score below or above par}\}$
 $= \{(0, -2), (0, -1), (0, 0), (1, 5)\}$

D: $\{0, 1\}$

R: $\{-2, -1, 0, 5\}$

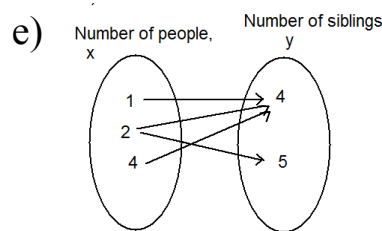


D: $\{2, 3, 4, 5\}$

R: $\{4, 6, 8, 10\}$

Function

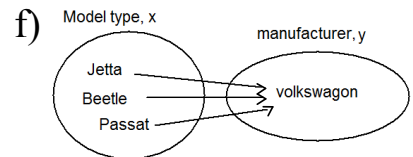
Not a function; $x=0$ repeats



D: $\{1, 2, 4\}$

R: $\{4, 5\}$

NOT a function
 $x=2$ repeats

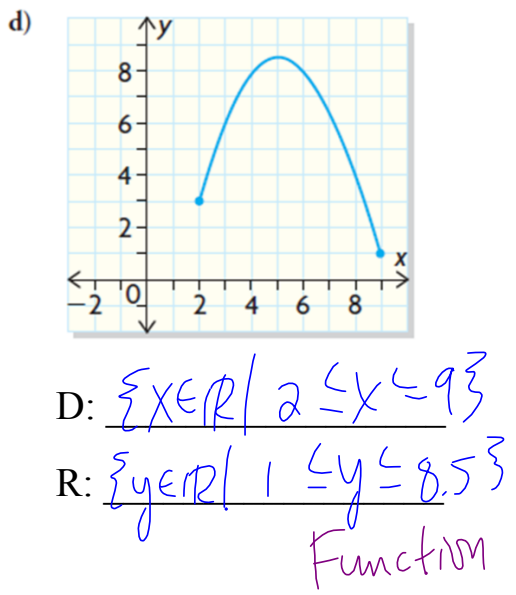
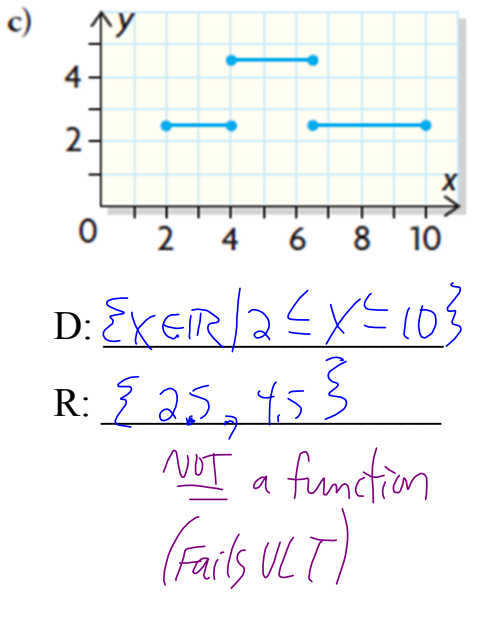
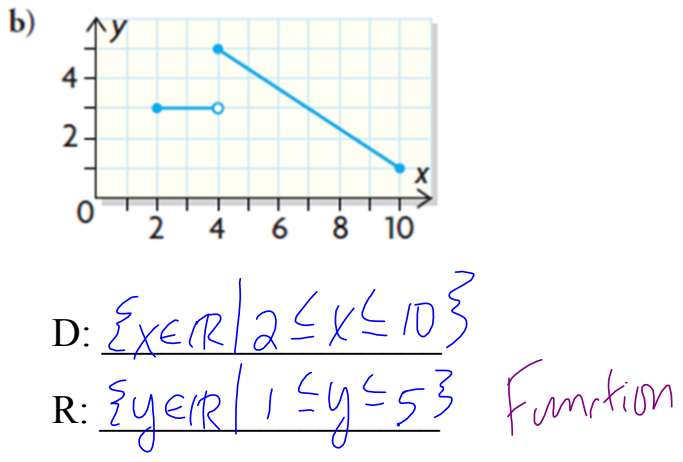
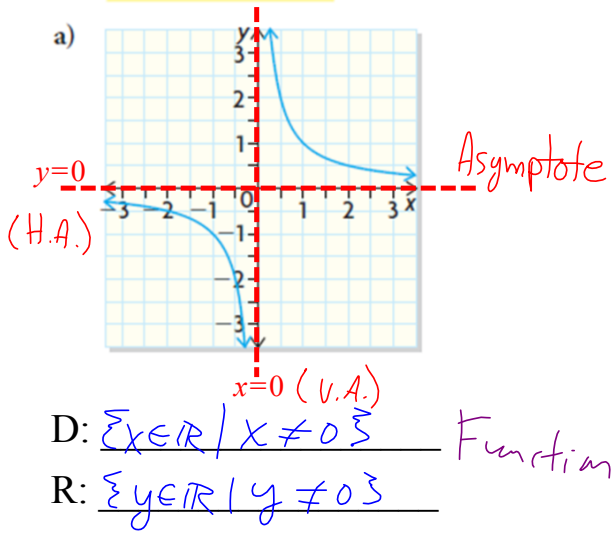


D: $\{J, B, P\}$

R: $\{V\}$

Function.

Ex.5: For each of the following relations, determine the domain and the range, using real numbers. State whether or not the relation is a function.



Ex. 6: Which variable would be associated with the domain for the following pairs of related quantities? Which variable would be associated with the range? Explain.

- a) heating bill, outdoor temperature *domain*
- b) report card mark, time spent doing homework *domain*
- c) number of slices of pizza, number of cuts *range* *domain*

Range is ALWAYS the DEPENDENT VARIABLE.