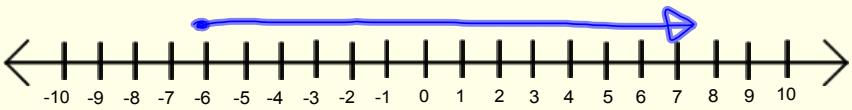
Rel & Func C3 - Domain & Range Notation

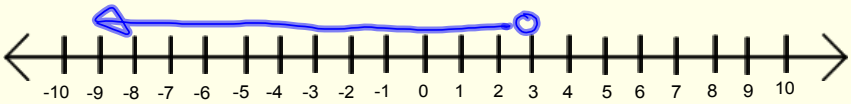
✓ Use lists, set notation & interval notation for domain & range

Inequalities Review

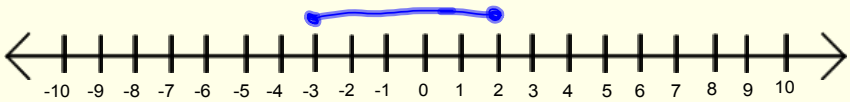
$x \geq -6$



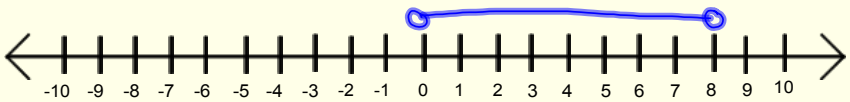
$x < 3$



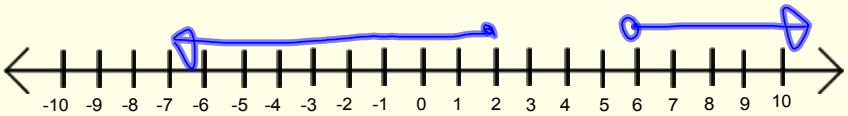
$-3 \leq x \leq 2$



$0 < x < 8$



$x \leq 2 \;\; or \;\; x > 6$



Domain & Range Notation

Discrete Data

List

$\{0, 1, 2, 3, 4\}$

Small amounts of data

Set Notation

$\{x \mid 0 \le x \le 100, x \in W\}$

Large amounts of data

Continuous Data

Set Notation

$\{y \mid 0 \le y < 10, y \in R\}$

Interval Notation

$(-3, 4]$

Domain & Range Notation

List: simply list all values for domain or range inside curly parentheses.

$D: \{0, 1, 2, 3, 4\}$ *All the whole numbers greater than or equal to 0 and less than or equal to 4.*

$R: \{0, 2, 4, 6, 8\}$ *All the even whole numbers greater than or equal to 0 and less than or equal to 8.*

Set Notation: use inequalities in the following format...

$D: \{x \mid 0 \le x \le 100, x \in R\}$ *All the real numbers greater than or equal to 0 and less than or equal to 100.*

Declare variable

restrictions

Declare # System

Interval Notation: simply state the start and end of the interval in brackets

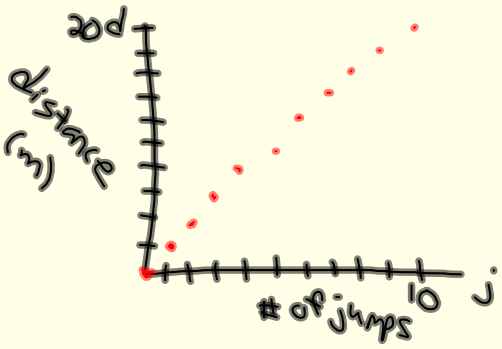
[- endpoint included
(- endpoint not included

$D: [-3, 4]$ *All the real numbers greater than or equal to -3 and less than or equal to 4.*

$R: (-3, 4]$ *All the real numbers greater than -3 and less than or equal to 4.*

Example #1

Georges the jumping frog



Domain: All the whole #'s greater than or equal to 0 and less than or equal to 10.

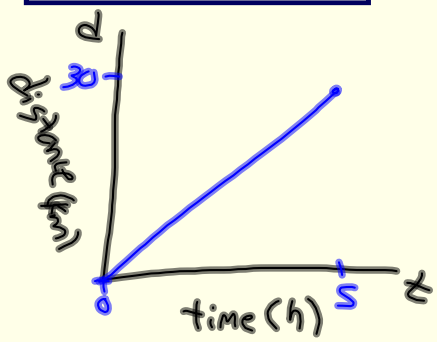
D: {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10} $\{j \mid 0 \le j \le 10, j \in W\}$

Range: All the even whole #'s greater than or equal to 0 and less than or equal to 20.

R: {0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20} $\{d \mid 0 \le d \le 20, d = 2j, j \in W\}$

Example #2

Swimming Killer Whale



Domain: All the real #'s greater than or equal to 0 and less than or equal to 5.

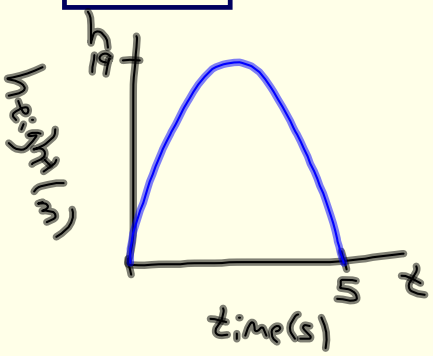
D: $\{t \mid 0 \le t \le 5, t \in R\}$ $[0, 5]$

Range: All the real #'s greater than or equal to 0 and less than or equal to 30.

R: $\{d \mid 0 \le d \le 30, d \in R\}$ $[0, 30]$

Example #3

Golf Shot



Domain: All the real #'s greater than or equal to 0 and less than or equal to 5.

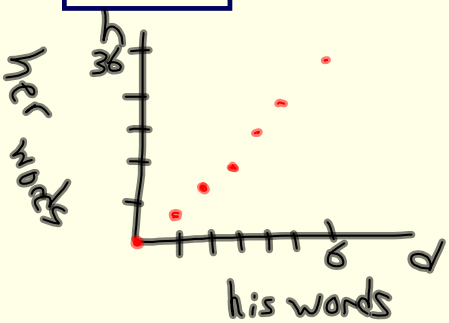
$D: \{t \mid 0 \le t \le 5, t \in R\}$ $[0, 5]$

Range: All the real #'s greater than or equal to 0 and less than or equal to approx 19.

$R: \{h \mid 0 \le h \le 19, h \in R\}$ $[0, 19]$

Example #4

Bad Date



Domain: All the whole #'s greater than or equal to 0 and less than or equal to 6.

$D: \{0, 1, 2, 3, 4, 5, 6\}$

Range: All the multiples of 6 greater than or equal to 0 and less than or equal to 36.

$R: \{0, 6, 12, 18, 24, 30, 36\}$

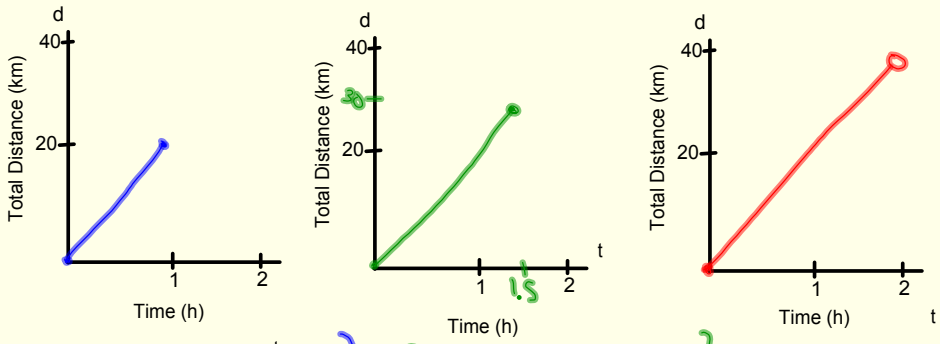
Example

The Boston Marathon is approximately 40 km long. Samuel runs at an average speed of 20 km/h and has attempted the Boston Marathon three times. Samuel wants to graph each of his attempts by graphing the total distance he ran in km, d, in relation to his time in hours, t.

Attempt #1 - Domain: $\{t \mid 0 \le t \le 1, t \in R\}$

Attempt #2 - Domain: $\{t \mid 0 \le t \le 1.5, t \in R\}$

Attempt #3 - Domain: $\{t \mid 0 \le t < 2, t \in R\}$



$R: \{d \mid 0 \le d \le 20, d \in R\}$

$R: [0, 20]$

$R: \{d \mid 0 \le d \le 30, d \in R\}$

$R: [0, 30]$

$R: \{d \mid 0 \le d < 40, d \in R\}$

$R: [0, 40)$

Practice

Write the domain and range for each question of your Graphing Relations Assignment using appropriate notation.

Graphing Relations with Domain & Range Assignment

Text pg. 123: 4, 1, 2