

4.4 Domain & Range

Domain: The set of all input (independent/x) values of a relation

Range: The set of all output (dependent/y) values of a relation

Ex. State the domain and range of the following relation:

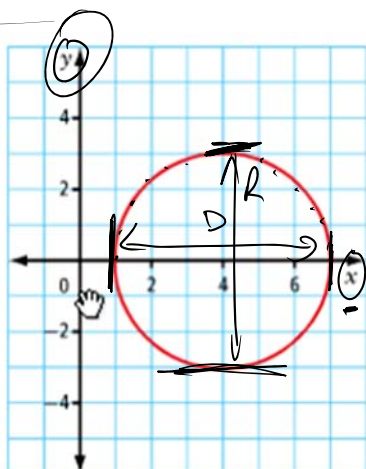
$(3, -2)(-1, 3)(4, 7)(-2, 0)(0, 3)$

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

Range $\{-2, 0, 3, 7\}$

Ex. For each graph, give the domain and range. Use words, a number line, interval notation, and set notation.

a)



Domain

All numbers from 1 to 7 inclusive.



$[1, 7]$

$\{x \mid 1 \leq x \leq 7, x \in \mathbb{R}\}$

Range

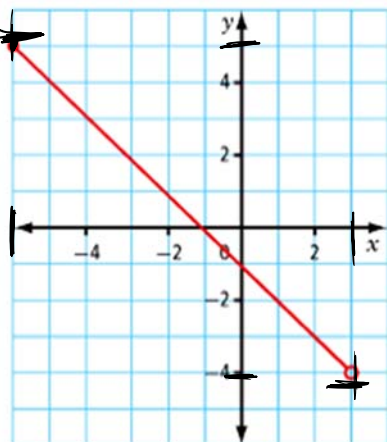
All numbers from -3 to 3 inclusive.



$[-3, 3]$

$\{y \mid -3 \leq y \leq 3, y \in \mathbb{R}\}$

b)



Domain

All numbers from -6 inclusive to 3 exclusive.



$[-6, 3)$

$\{x \mid -6 \leq x < 3, x \in \mathbb{R}\}$

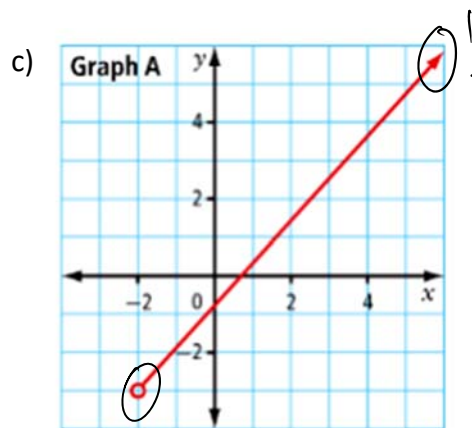
Range

All numbers from -4 exclusive to 5 inclusive.

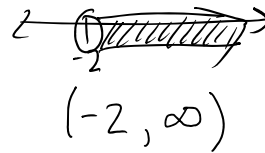


$(-4, 5]$

$\{y \mid -4 < y \leq 5, y \in \mathbb{R}\}$

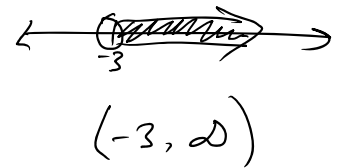


Domain
All numbers larger than -2.

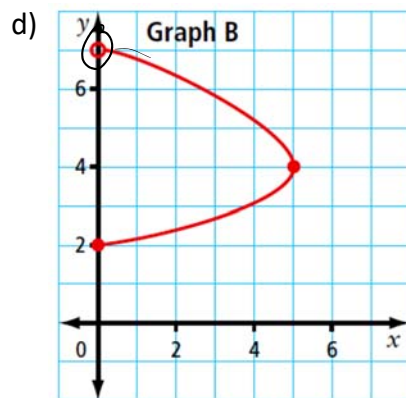


$$\{x \mid x > -2, x \in \mathbb{R}\}$$

Range
All numbers greater than -3.



$$\{y \mid y > -3, y \in \mathbb{R}\}$$

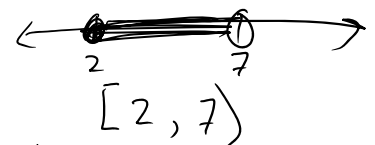


Domain
All numbers from 0 to 5 inclusive



$$\{x \mid 0 \leq x \leq 5, x \in \mathbb{R}\}$$

Range
All numbers from 2 inclusive to 7 exclusive

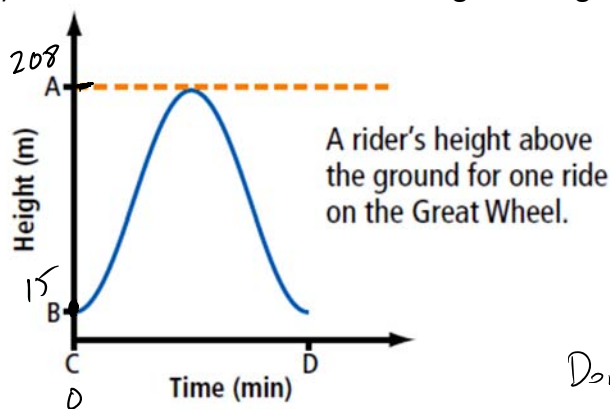


$$\{y \mid 2 \leq y < 7, y \in \mathbb{R}\}$$

Ex. The Great Wheel was ^{once}~~one~~ proposed to be built in Beijing in the People's Republic of China. If finished, it would have been the largest Ferris wheel in the world. The wheel was supposed to have a diameter of 193 m and would have reached a maximum height of 208 m. The graph shows a rider's height relative to the ground for a 20 minute ride through one rotation.

a) What are the values of the points A, B, C, and D and what do they represent?

b) What are the domain and the range of the graph?



$$A = 208 \text{ m}$$

$$B = 208 - 193 = 15 \text{ m}$$

$$C = 0 \text{ min}$$

$$D = 20 \text{ min}$$

$$\text{Domain } \{t \mid 0 \leq t \leq 20, t \in \mathbb{R}\}$$

$$\text{Range } \{h \mid 15 \leq h \leq 208, h \in \mathbb{R}\}$$