6.3 Domain & Range

Definitions

Domain: All possible values for x.

Range: All possible values for y.

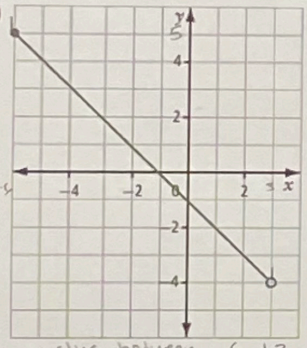
Graphing Steps

1. [Y=] button
2. Type in equation using [X,T,θ,n] button to represent variable
3. [window]
4. Change x and y mins & max values based on your domain and range.
5. [Graph]

Example 1 Determine the Domain and Range From a Graph

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

a)



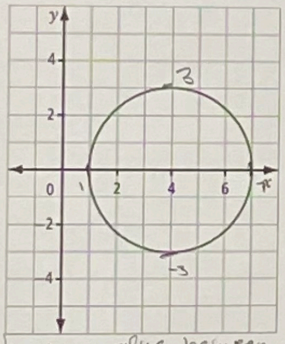
D: Any value between -6 & 3.

[-6,3) $\{-6 \le x < 3, x \in R\}$

R: Any value between -4 & 5

(-4,5] $\{-4 < y \le 5, y \in R\}$

b)



D: Any value between 1 & 7.

[1,7] $\{1 \le x \le 7, x \in R\}$

R: Any value between -3 & 3

[-3,3] $\{-3 \le y \le 3, y \in R\}$

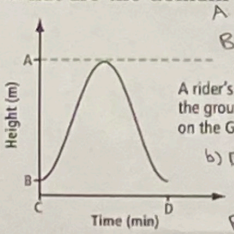
Example 2 Domain and Range for a Situation

The Great Wheel is being built in Beijing in the People's Republic of China. When finished, it will be the largest Ferris wheel in the world. The wheel will have a diameter of 193 m and will reach a maximum height of 208 m.

The graph shows a rider's height relative to the ground for a 20-min ride through one rotation.

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

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



A rider's height above the ground for one ride on the Great Wheel.

A 208m → max height

B 15m → starting height

C 0mins → start of ride (15m height)

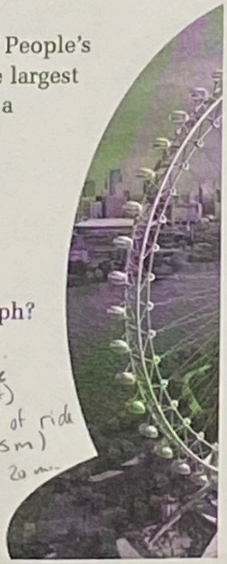
D 20 mins → end of ride (15m)

b) D: Values between 0 and 20 mins

$\{0 \le t \le 20, t \in R\}$

R: Values between 15 and 208m

$\{15 \le h \le 208, h \in R\}$

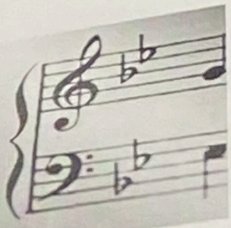


Example 3 Domain and Range for Discrete Data

Caitlin is marking time for some music by clapping on the first beat of every bar. The table of values and the set of ordered pairs show the relationship between the total number of beats and her total number of claps. Give the domain and range of the relation using words and a list.

Number of Beats	Number of Claps
1	1
5	2
9	3
13	4
17	5
21	6
25	7
29	8

Ordered Pairs (Beats, Claps)
{(1, 1), (5, 2), (9, 3), (13, 4), (17, 5), (21, 6), (25, 7), (29, 8)}



D: The number of beats is represented by the values 1, 5, 9, 13, 17, 21, 2, and 29.

$\{1, 5, 9, 13, 17, 21, 25, 29\}$

R: The number of claps is represented by values 1, 2, 3, 4, 5, 6, 7 and 8. (1 through 8 exclusively)

$\{1, 2, 3, 4, 5, 6, 7, 8\}$

Example 4 Use Technology to Graph a Relation With a Restricted Domain

A variety of corn plant grows at an average rate of 4.5 cm per day from the start of the third week of growth to the end of the sixth week. The plant's growth can be modelled using the formula $h = 4.5a + 25$, where h is the height of the plant, in centimetres, and a is the age of the plant, in days. Use a graphing calculator to create a graph of a cornstalk's height from the beginning of week 3 to the end of week 6.

a) 14 days } Domain
42 days

b) x = 14 days (a)

$4.5(14) + 25 = h$

$h = 88$ cm

a = 42 days

$4.5a + 25 =$

$4.5(42) + 25 =$

$h = 214$