

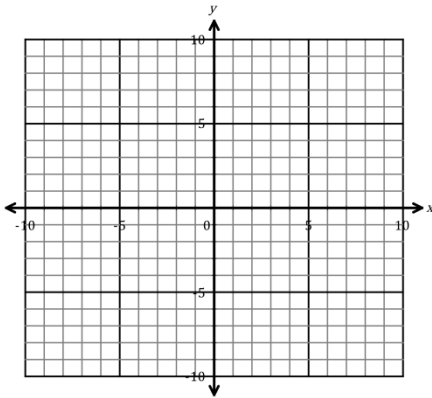
NOTES: SECONDARY 2 HONORS

GRAPH QUADRATIC FUNCTIONS GIVEN KEY FEATURES/DOMAIN AND RANGE (2.8, 2.9)

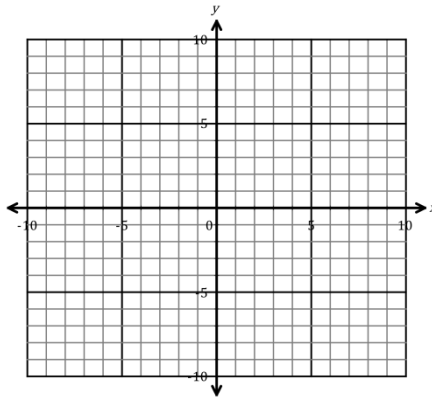
Example #1

Sketch the graph of the quadratic function given the x- and y-intercept(s), and the minimum point. Label all of the key features on your graph.

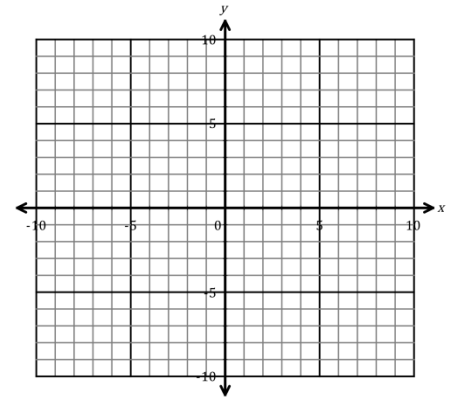
1. x-intercept(s): (-1, 0) & (5, 0)
 y-intercept: (0, -5)
 minimum: (2, -9)



2. x-intercept: (-3,0)
 y-intercept: (0,6)
 minimum: (-3,0)



3. x-intercept: (0,0) & (-4,0)
 y-intercept: (0,0)
 maximum: (-2,4)

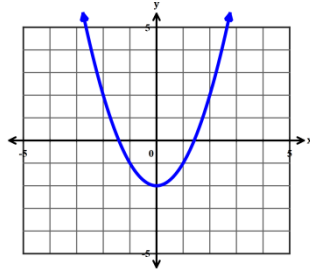


Vocabulary

- The **domain** is the set of all possible _____ where the graph is defined.
- The variable (usually x) that represents the **domain** is the _____.
- The **range** is the set of all possible _____ on the graph.
- The variable (usually y) that represents the **range** is the _____.
- The **domain** and **range** are written from the _____ to _____ value.
- When modeling real world situations, the **domain** and **range** are values that make sense for the problem.

Example #2

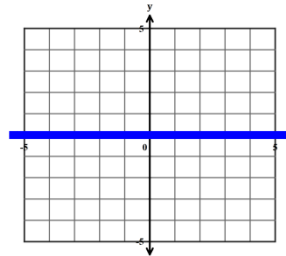
Find the domain and range of the function $f(x) = x^2 - 2$ graphed below.



Domain

1. List all of the x -values of the function.

If you were to flatten the function against the x -axis you would see something like this:



The function is defined for all the x -values.

2. Write the domain in interval notation.

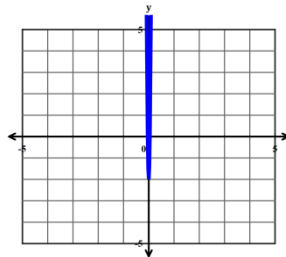
The domain is: *all real numbers*

$$\mathbb{R} \text{ or } (-\infty, \infty)$$

Range

1. List all of the y -values of the function graphed.

If you were to flatten the function against the y -axis you would see this:



The function is defined for all y values greater than or equal to -2

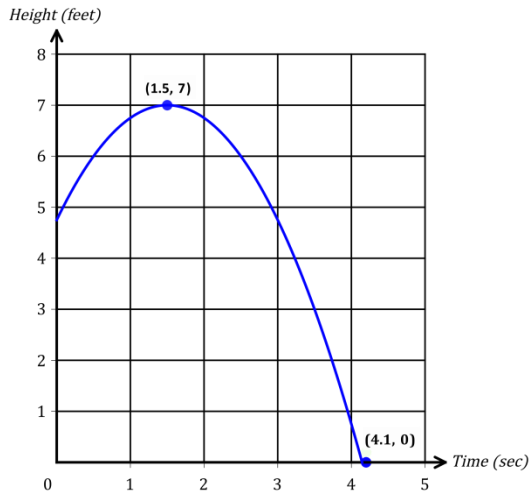
The range is $y \geq -2$ or $[-2, \infty)$.

2. Write the range in interval notation.

Example #3

The path of a ball thrown straight up can be modeled by the equation $h(t) = -t^2 + 3t + 4.75$ where $h(t)$ is the height of the ball and t is the time in seconds.

What is the real world domain and range for the situation?



Domain

1. Find all the values that would make sense for the situation.

2. Write the domain in interval notation.

Range

1. Find all the values that would make sense for the situation.

2. Write the range in interval notation.

The domain represents the observation time of the ball.

At $t = 0$ observation begins. The ball will hit the ground at 4.1 seconds. Once the ball hits the ground observation ends.

The domain will be $0 \leq t \leq 4.1$ seconds.

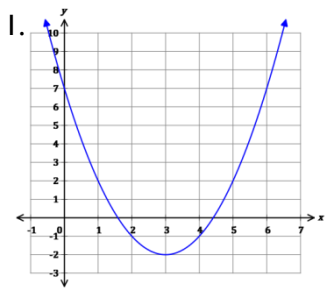
The domain is $[0, 4.1]$ seconds.

The ball will not go lower than the ground so the height must be greater than or equal to zero. The ball will go no higher than its maximum height so the height must be less than or equal to 7 feet.

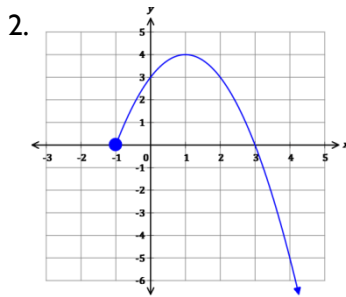
The range will be $0 \leq h \leq 7$ feet.

The range is $[0, 7]$ feet.

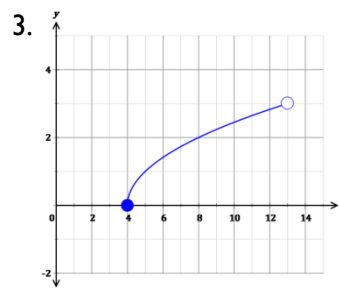
Identify the domain and range of each function.



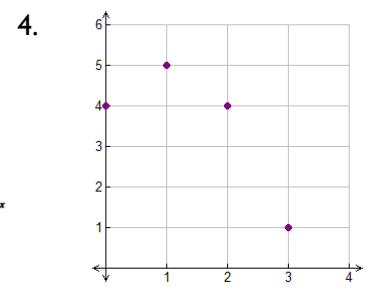
Domain:
Range:



Domain:
Range:



Domain:
Range:



Domain :
Range :

Determine a *reasonable domain* and *range* for each situation. Write using interval notation and include units of measure. *answers will vary*

5. Temperatures during a year

6. Someone diving into a swimming pool

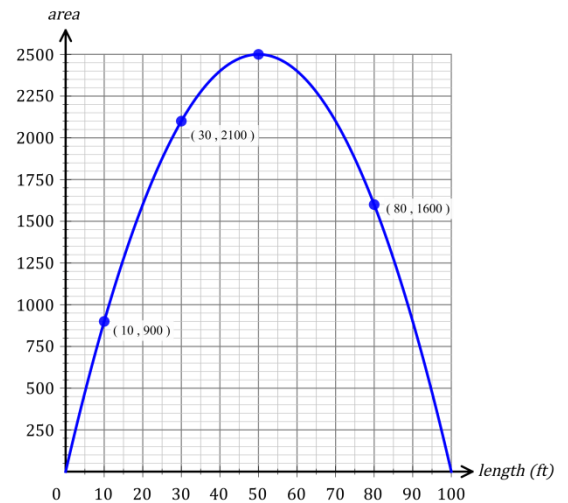
7. The graph represents a rectangular area that can be enclosed by 100 feet of fencing.

a) What is the **domain** of the function?

b) What is the **range** of the function?

c) What does the **y-intercept** represent?

d) What does the **x-intercept** represent?



e) What is the amount of area enclosed if one side of the rectangle is 10 ft.

f) What is the maximum area that can be enclosed and what is the corresponding length of one side of the rectangle.