

4.1 Exponential Functions

Warm-Up

Write all you know about the following terms.

Domain

Intercept

Increasing Function

Range

Slope

Decreasing Function

Main Topic Exponential Functions and Their Graphs



List at least 3 acts of kindness that you can share with your community.

Two individuals are planning to start the campaign.

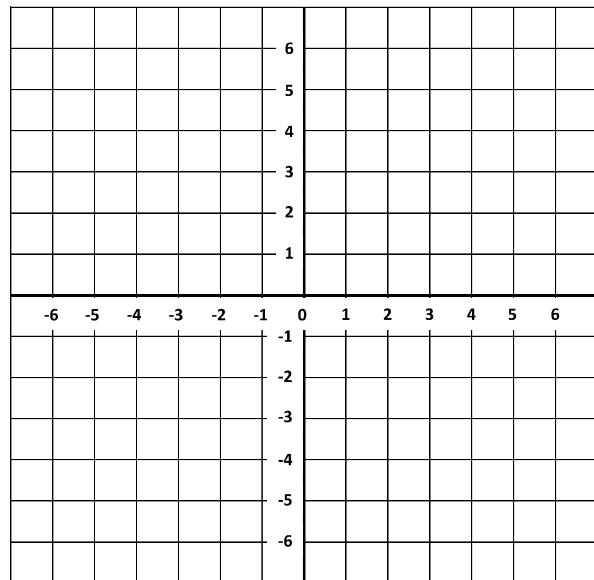
Fill out the table below.

No. of Days	1	2	3	4	5	6	7	x
No. of Individuals								---
Exponential Expression								

- What is the expected number of individuals participating in the campaign on the 4th day?
- How many days will it take for every individual in your city to participate in the campaign?

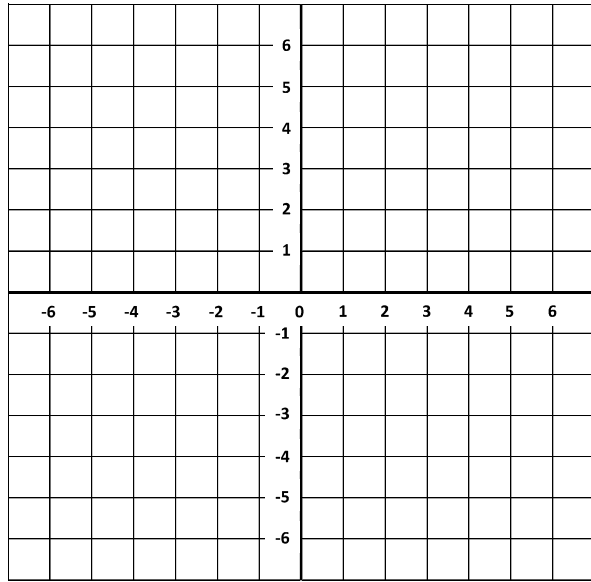
Properties of Exponential Functions

- Graph $f(x) = 2^x$.
- Identify the following features of the function.
 - Domain:
 - Range:
 - Asymptote:
 - x-intercept:
 - y-intercept:
 - Left End Behavior:
 - Right End Behavior:
 - Increasing or Decreasing:



Asymptote

An **asymptote** is a straight line where a graph is trying to approach but never touches it. For $f(x) = 2^{-x} - 5$, the asymptote is -5.



- Graph $f(x) = 2^{-x} + 3$.
- Identify the following features of the function.
 - Domain:
 - Range:
 - Asymptote:
 - x-intercept:
 - y-intercept:
 - Left End Behavior:
 - Right End Behavior:
 - Increasing or Decreasing:

Complete the tables with necessary information.

Domain and Range	x and y intercepts
<div style="border: 1px solid black; border-radius: 15px; background-color: #d9e1f2; padding: 5px; display: inline-block;"> $f(x) = 2^x + 3$ </div>	
Asymptote	Left and Right End Behavior

Domain and Range	x and y intercepts
<div style="border: 1px solid black; border-radius: 15px; background-color: #d9e1f2; padding: 5px; display: inline-block;"> $f(x) = -2^x + 3$ </div>	
Asymptote	Left and Right End Behavior

Quick Math

What is the x-intercept and y-intercept of $f(x) = 5 - 4^x$?

Transformations of Functions

Write your observations when $f(x) = 2^x$ is changed to

$f(x) = 2^x - 5$

$f(x) = 2^{-x} + 5$

$f(x) = -2^x + 5$

$f(x) = 2^{x-4} + 5$



Fill in the blank

Word Bank: Translates, Reflects, Horizontal, Vertical, Left, Right, Down, Up

$$f(x) = 4^x + 2 \rightarrow f(x) = -4^{-x} + 2$$

The negative sign for 4 _____ the graph over a _____ line then the negative sign for x _____ the graph over a _____ line.

$$f(x) = 6 - 3^{-x} \rightarrow f(x) = -4 + 3^{-x}$$

The negative sign for 4 _____ the graph 10 units down then the positive sign for 3 _____ the graph over a _____ line.

$$f(x) = 5^{-x+3} - 2 \rightarrow f(x) = 5^{-x-4} - 6$$

The negative sign for 4 _____ the graph 7 units to the _____ then the negative sign for 6 _____ the graph 4 units _____.

$$f(x) = 7^{x+4} - 1 \rightarrow f(x) = 7^{x+1} + 5$$

The positive sign for 1 _____ the graph 3 units to the _____ then the positive 5 _____ the graph 6 units _____.

Foldable

Foldable

End-of-Course Prep

