

UNIT 3 • LINEAR AND EXPONENTIAL FUNCTIONS

Lesson 4: Analyzing Linear and Exponential Functions

Instruction

Guided Practice 3.4.2

Example 1

Create a table of values for the exponential function $f(x) = 3(2)^x + 4$. Identify the asymptote and y -intercept of the function. Plot the points and sketch the graph of the function, and describe the end behavior.

1. Create a table of values.

Choose values of x and solve for the corresponding values of $f(x)$.

x	$f(x)$
-4	4.1875
-2	4.75
0	7
2	16
4	52

2. Identify the asymptote of the function.

The asymptote of the function is always the constant, k .

In the function $f(x) = 3(2)^x + 4$, the value of k is 4.

The asymptote of the function is $y = 4$.

3. Determine the y -intercept of the function.

The y -intercept of the function is the value of $f(x)$ when x is equal to 0.

It can be seen in the table that when $x = 0$, $f(x) = 7$.

The y -intercept is $(0, 7)$.

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- It is easiest to first graph the function and then observe what happens to the value of y as the value of x increases and decreases.
- Graph complex exponential models using technology as values can become quite large or small very quickly.

Graphing Equations Using a TI-83/84:

Step 1: Press [Y=].

Step 2: Key in the equation using [X, T, θ , n] for x .

Step 3: Press [WINDOW] to change the viewing window, if necessary.

Step 4: Enter in appropriate values for Xmin, Xmax, Xscl, Ymin, Ymax, and Yscl, using the arrow keys to navigate.

Step 5: Press [GRAPH].

Graphing Equations Using a TI-Nspire:

Step 1: Press the home key.

Step 2: Arrow over to the graphing icon (the picture of the parabola or the U-shaped curve) and press [enter].

Step 3: Enter in the equation and press [enter].

Step 4: To change the viewing window: press [menu], arrow down to number 4: Window/Zoom, and click the center button of the navigation pad.

Step 5: Choose 1: Window settings by pressing the center button.

Step 6: Enter in the appropriate XMin, XMax, YMin, and YMax fields.

Step 7: Leave the XScale and YScale set to auto.

Step 8: Use [tab] to navigate among the fields.

Step 9: Press [tab] to "OK" when done and press [enter].

Common Errors/Misconceptions

- incorrectly plotting points
- mistaking the y -intercept for the x -intercept and vice versa
- not being able to identify key features of an exponential model
- confusing the value of a function for its corresponding x -coordinate