**4.4 Graphing Exponentials (A.CED.2)**

SM1H

Exponential functions have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with an exponent *x*. The base is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for the function.

Here is an example of a basic exponential function. Use your calculator to check your answers.



|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|

|  |  |
| --- | --- |
|  |  |
| $$x$$ | $$f\left(x\right)$$ |
| -2 |  |
| -1 |  |
| 0 |  |
| 1 |  |
| 2 |  |

 |  |

Find the y-intercept: ( , ).

End behavior:

As x 🡪 ∞ y 🡪 \_\_\_\_\_\_\_\_.

As x 🡪 -∞ y 🡪 \_\_\_\_\_\_\_\_.

So we see the graph of the function will never cross the line \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

We call this kind of line (where the graph gets close, but doesn’t touch it) an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Try the following:

1. $f\left(x\right)=2\left(\frac{1}{2}^{x}\right)$

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|

|  |  |
| --- | --- |
| *x* | *f*(*x*) |
| -2 |  |
| -1 |  |
| 0 |  |
|  1 |  |
| 2 |  |

 |  | y-intercept: ( , ) As x🡪 ∞ y🡪 \_\_\_\_\_\_\_\_.As x🡪 -∞ y🡪 \_\_\_\_\_\_\_\_.Increasing or decreasing?Asymptote: |

1. $f\left(x\right)=2^{x}+3$

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|

|  |  |
| --- | --- |
| *x* | *f*(*x*) |
| -2 |  |
| -1 |  |
| 0 |  |
|  1 |  |
| 2 |  |

 |  | y-intercept: ( , ) As x🡪 ∞ y🡪 \_\_\_\_\_\_\_\_.As x🡪 -∞ y🡪 \_\_\_\_\_\_\_\_.Increasing or decreasing?Asymptote: |