

## Lesson 4.1: Exponential Functions

The **exponential function** with \_\_\_\_\_ is defined for all real numbers  $x$  by:

### Evaluating Exponential Functions

**Example:** Let  $f(x) = 3^x$ , evaluate the following.

a.  $f(2)$

c.  $f\left(\frac{-2}{3}\right)$

b.  $f(\pi)$

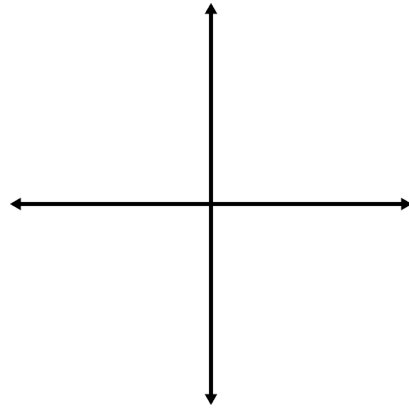
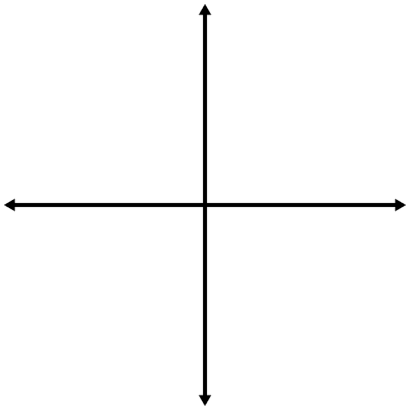
d.  $f(\sqrt{2})$

### Graphs of Exponential Functions

Graphs of exponential functions have domain \_\_\_\_\_ and range \_\_\_\_\_ .

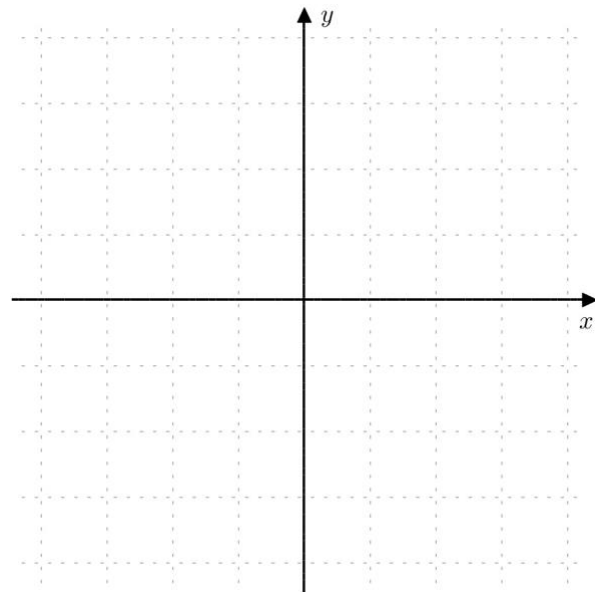
The \_\_\_\_\_ is a horizontal asymptote of exponential functions.

The graph of exponential functions have one of the following shapes:



**Examples:** Plot the following equations on the same set of axes.

- a.  $y = 2^x$
- b.  $y = 1 + 2^x$
- c.  $y = -2^x$
- d.  $y = 2^{x-1}$



### Compound Interest

**Compound Interest** is calculated by the formula:

**Example:** Find the annual percentage yield for an investment that earns interest at a rate of 6% per year, compounded daily.