

# Calculus Lecture Notes

Unit: Special Functions

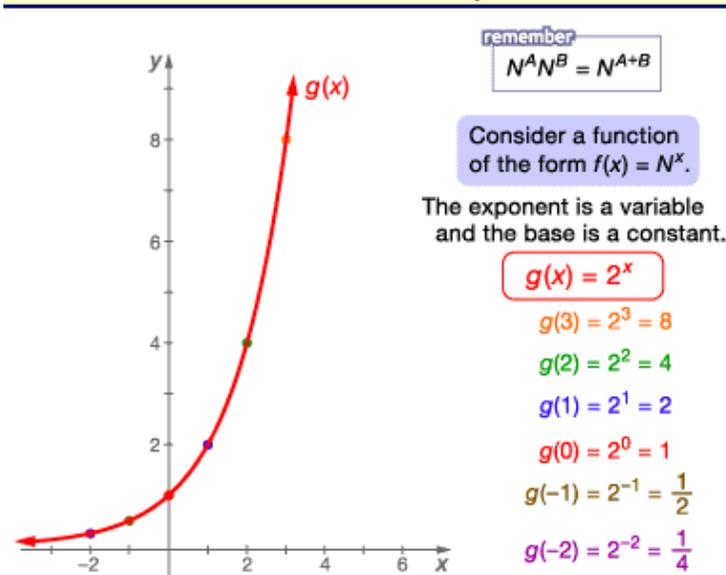
Module: Exponential Functions

## Graphing Exponential Functions

**key concepts:**

- An **exponential function** has the variable in the exponent, not the base.
- Exponential functions cannot have negative bases. Exponential functions with positive bases less than 1 have graphs that are decreasing.

### Functions with a variable as the exponent

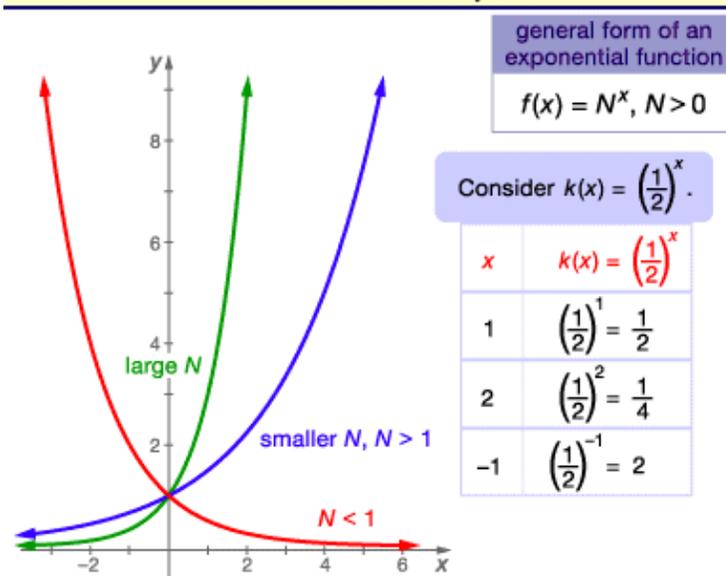


An **exponential function** is a function whose variable is in the exponent.

To graph an exponential function, try plotting some points.

Remember, a number raised to a negative power moves into the denominator.

### Functions with a variable as the exponent



All the exponential functions have the same basic shape, but the value of the base does affect the appearance of the curve.

For larger bases, the graph becomes very steep in the first quadrant. However, in the second quadrant the graph is very flat. Notice that the graph is always increasing.

The smaller the base, the less steep the curve will be in the first quadrant.

For bases less than one but greater than zero, the graph reflects across the y-axis.

The exponential function is not defined for negative bases.