TOPIC: INTRODUCTION TO EXPONENTIAL FUNCTIONS

Exponential Functions

◆ **Polynomial** functions have a variable base with a number exponent; **exponential** functions have the opposite!

- Exponential functions have a:
  - **Base** that is _____, _____, & ___ 1.
  - **Exponent** (power) that contains a _____.

Recall — Polynomial Function

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

New — Exponential Function

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

Power: x

Base: 2

EXAMPLE Determine if each function is an exponential function.

(A) $f(x) = \left(\frac{2}{3}\right)^x$

Exponential function? ☐

Power: _____

Base: _____

(B) $f(y) = 1^y$

Exponential function? ☐

Power: _____

Base: _____

(C) $f(x) = 10^{x+1}$

Exponential function? ☐

Power: _____

Base: _____

◆ You will be asked to evaluate exponential functions for specified values of x.

- For exponents that cannot easily be done by hand, type (BASE) ^ (POWER) into a calculator.

EXAMPLE Evaluate the exponential function $f(x) = 2^x$ for each given value of x.

(A) $x = 4$

(B) $x = -3$

(C) $x = 3.14$

(D) $x = 12$

TOPIC: INTRODUCTION TO EXPONENTIAL FUNCTIONS

PRACTICE Determine if each function is an exponential function. If so, identify the power & base, then evaluate for $x = 4$.

(***A***)

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

Exponential function? ☐

Power: _____

Base: _____

$f(4) =$_____

(***B***)

$f(x) = 3(1.5)^x$

Exponential function? ☐

Power: _____

Base: _____

$f(4) =$_____

(***C***)

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

Exponential function? ☐

Power: _____

Base: _____

$f(4) =$_____