

TOPIC: 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	New	Exponential Function
	$f(x) = x^2$		$f(x) = 2^x$ Base: 2, Power: x

EXAMPLE

Determine if each function is an exponential function.

(A) $f(x) = \left(\frac{2}{3}\right)^x$ Exponential function? <input type="checkbox"/> Power: _____ Base: _____	(B) $f(y) = 1^y$ Exponential function? <input type="checkbox"/> Power: _____ Base: _____	(C) $f(x) = 10^{x+1}$ Exponential function? <input type="checkbox"/> Power: _____ Base: _____
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◆ 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) $x = 12$
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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: _____

$$f(4) = \underline{\hspace{2cm}}$$

(B)

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

Exponential function? ☐

Power: _____

Base: _____

$$f(4) = \underline{\hspace{2cm}}$$

(C)

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

Exponential function? ☐

Power: _____

Base: _____

$$f(4) = \underline{\hspace{2cm}}$$

PRACTICE

Use a calculator to evaluate the following exponential expression. Round to three decimal places.

(A)

$$7^{1.3}$$

(B)

$$3^{\sqrt{6}}$$

(C)

$$13^\pi$$