

## **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 \_\_\_\_\_.



### **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: 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: \_\_\_\_\_

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

**(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)**

$$13^\pi$$