

**8** I can use previous skills learned as they apply to Chapter 8 topics.

**8.1A** I can multiply exponential expressions.

*Ex 1a: Multiply the following expressions:*

a.  $5^4 \cdot 5^8$

b.  $(3^5)(3)$

c.  $x^5 \cdot x^3$

**8.1B** I can raise exponential expressions to a power.

*Ex 1b: Simplify the following expressions:*

a.  $(b^2)^7$

b.  $(-3x)^4$

c.  $(3m^7)^4 \cdot m^3$

**8.1C** I can raise a product to a power.

*Ex 1c: Simplify the following expressions:*

a.  $(2 \cdot 3)^3$

b.  $(x \cdot y)^8$

c.  $(x^2 \cdot u^4)^6$

**8.1D** I can apply the concepts learned to solve word problems.

*Ex 1d: You are designing a wall mural that will be composed of squares of different sizes. One of the requirements of your design is that the side length of each square is itself a perfect square.*

a. *If you represent the side length of a square as  $x^2$ , write an expressions for the area of a mural square.*

b. *Find the area of a mural square when  $x = 5$*

**8.2A** I can divide exponential expressions with the same base.

*Ex 2a: Simplify:*  $\frac{1}{y^6} \cdot y^{15}$

**8.2B** I can raise a quotient to a power.

*Ex 2b: Simplify each of the following expressions:*

a.  $\left(\frac{a}{b}\right)^8$

b.  $\left(\frac{a^3}{2b^5}\right)^4$

c.  $\frac{1}{4x^5} \cdot \left(\frac{2x^2}{y^3}\right)^5$

**8.2C** I can apply the concepts learned to solve word problems

*Ex 2b: The distance from the Earth to the nearest galaxy is about  $10^{22}$  meters. The distance from the Earth to the North Star is about  $10^{19}$  meters. How many times further from Earth is the nearest galaxy than the North Star?*

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**8.3 A** I can simplify expressions using exponents that are zero or negative numbers.

*Ex 3a: 1. Evaluate each expression:*

a.  $10^{-3}$       b.  $\left(\frac{4}{3}\right)^0$       c.  $4^{-6} \cdot 4^3$       d.  $\frac{1}{5^{-4}}$

*2. Simplify each expression:*

a.  $6y^{-4}$       b.  $a^2b^{-4}$       c.  $(4x^{-3}y^2)^{-3}$

d.  $(8mn^3)^0$       e.  $\frac{x^{-6}}{4y^5}$

**8.3B** I can apply the concepts learned to solve word problems

*Ex 3b: A hole punch makes holes in your paper that have a diameter of  $4^{-1}$  inch.*

a. *Write an expression for the area of one punched hole.*

*Use the formula  $A = \pi r^2$*

b. *Your hole punch makes 3 holes in a page. Write an expression for the total area punch out of one sheet of paper.*

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**8.4A** I can read and write values in scientific notation.

*Ex 4a*

a) *Write each number in scientific notation: 85.2, 0.00095, 630,000*

b) *Write each number in standard notation:  $9.1 \times 10^8$ ,  $4.7 \times 10^{-3}$ ,  $6.05 \times 10^2$*

**8.4B** I can simplify expressions using scientific notations.

*Ex 4b: Evaluate each expression:*

a.  $(5.7 \times 10^3)(2.2 \times 10^{-6})$       b.  $\frac{6.5 \times 10^{-7}}{1.3 \times 10^{-3}}$       c.  $(3 \times 10^{-9})^4$

**8.4C** I can compare numbers in standard decimal notation with numbers presented in scientific notation as well as comparing two numbers both of which are presented in scientific notation.

*Ex 4c: Order the numbers from least to greatest:*

$1.305 \times 10^{-3}, 0.000526, 2.018 \times 10^{-3}, 0.00205$

**8.4D** I can apply the concepts learned to solve word problems

*Ex 4d: Texas has an area of approximately  $4.11 \times 10^5$  square kilometers. In 2000, the population of Texas was approximately  $3.39 \times 10^7$  people. How many people were there per square kilometer in Texas in 2000?*

**8.5A** I can write and graph exponential growth models.

*Ex 5a: Graph each function and identify its domain and range.*

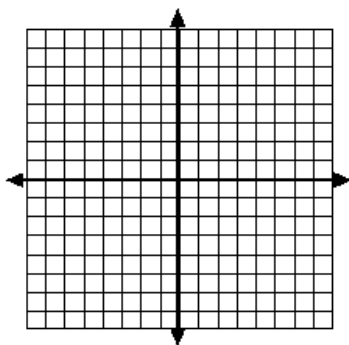
1.  $y = -4^x$

$x = 0 \rightarrow$  \_\_\_\_\_, point = \_\_\_\_\_

$x = 1 \rightarrow$  \_\_\_\_\_, point = \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_



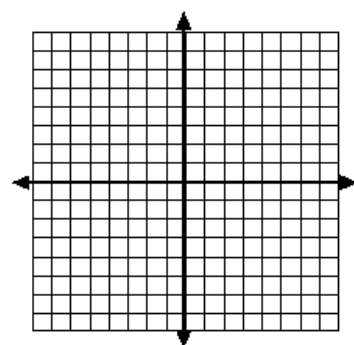
2.  $y = 2 \cdot \left(\frac{4}{3}\right)^x$

$x = 0 \rightarrow$  \_\_\_\_\_, point = \_\_\_\_\_

$x = 1 \rightarrow$  \_\_\_\_\_, point = \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_



- 8.5B** I can apply the concepts learned to solve word problems.  
*Ex 5b: You deposit \$200 in a savings account that earns 3% interest compounded yearly.  
 Find the balance in the account after 5 years.*
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- 8.6A** I can write and graph exponential decay models.  
*Ex 6a: Graph each function.*

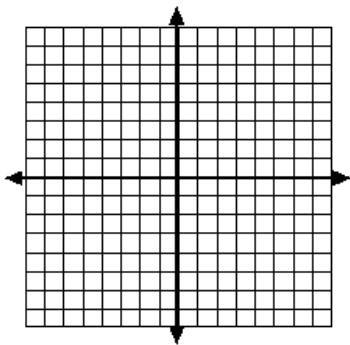
1.  $y = -\left(\frac{1}{8}\right)^x$

$x = 0 \rightarrow$  \_\_\_\_\_, point = \_\_\_\_\_

$x = 1 \rightarrow$  \_\_\_\_\_, point = \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_



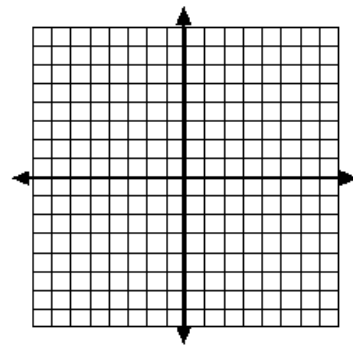
2.  $y = 2 \cdot (0.25)^x$

$x = 0 \rightarrow$  \_\_\_\_\_, point = \_\_\_\_\_

$x = 1 \rightarrow$  \_\_\_\_\_, point = \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_



- 8.6B** I can use exponential decay models to solve problems.  
*Ex 6b: A school district bought a bus in 1990 for \$54,000. The value of the tractor has been decreasing at a rate of 3% per year.*
- Use the information to write an exponential decay model*

b. *What was the approximate value of the bus in 1998?*

- 8.6C** I can distinguish between exponential growth and exponential decay  
*Ex 6c: For a and b, determine whether each situation is exponential growth or exponential decay - you do not have to solve!*
- You deposit \$5,800 into an account that pays 3% interest compounded annually.*
  - A car collector bought a car in 1998 for \$25,000. The value of the car has been decreasing at a rate of 12% per year.*