

7-1 Zero and Negative Exponents

Simplify each expression completely. Leave your answer in fraction form, if necessary. (1 pt each)

1. y^{-3}

2. x^0

3. $4t^{-2}$

4. $\frac{2}{y^{-5}}$

5. $\frac{3^{-2}}{w}$

6. $2^{-4}x^2y^{-5}$

8. Suppose the population of a certain type of fox in Yellowstone National Park increases by 5% every year. This is modeled by the expression $P = 500(1.05)^y$, where y is the number of years since 2010.

a. About how many foxes are predicted in the year 2020?

(2)

b. About how many foxes were there in the year 2000?

(2)

7-2 Multiplying Powers With the Same Base

Simplify each expression completely. Leave your answer in fraction form, if necessary. (1 pt each)

1. $x^7 \cdot x^{-1}$

2. $y^{-5} \cdot y^2$

3. $2z^3 \cdot z^{-4} \cdot 5z^4$

4. $(-2a^3)(-a)$

5. $(4b^{-2})(-2b^{-3})$

6. $(-5h^{-3})(-2h^{-4})$

7. Simplify each expression. Write your answer in scientific notation.

a. $(7 \times 10^{-2})(2 \times 10^5)$

b. $(0.1 \times 10^7)(0.3 \times 10^8)$

8. A gallon of water contains about 12.7×10^{25} molecules. The Mississippi River discharges about 2.69×10^7 gal every minute. About how many molecules is this?

7-3 More Multiplication Properties of Exponents

Simplify each expression completely. Leave your answer in fraction form, if necessary. (1 pt each)

1. $(a^2)^6$

2. $(a^{-2})^3$

3. $(x^{-3})^{-4}$

4. $(2a^{-7})^3$

5. $(6x^{-4})^{-2}$

6. $(n^3)^3(2n^{-1})^{-4}$

7. Simplify each expression. Write your answer in scientific notation.

a. $(4 \times 10^5)^4$

b. $(4 \times 10^{-5})^6$

(2)

(2)

7-4 Division Properties of Exponents

Simplify each expression completely. Leave your answer in fraction form, if necessary. (1 pt each)

1. $\frac{a^2}{a^4}$

2. $\frac{2x^2y^4}{3x^3y^2}$

3. $\left(\frac{c}{2c^0}\right)^2$

4. $\left(\frac{3b^2}{c^2}\right)^{-4}$

5. $\frac{(x^2y^2)(-2y^7)}{(xy^4)(14y^2)}$

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

7. Simplify the expression. Write your answer in scientific notation.

$$\frac{3.066 \times 10^8}{7.3 \times 10^3}$$

(2)

8. The population of Earth is about 6.6468×10^9 . Land surface of Earth is about 0.573×10^8 square miles. What is the population density for the surface area of the Earth, in people per square mile? Write your answer using scientific notation.

(2)

7-5 Rational Exponents and Radicals

Find the value of each expression. (1 point each)

1. $\sqrt[4]{81}$

2. $25^{\frac{1}{2}}$

3. $16^{\frac{3}{2}}$

Write each expression in radical form. (1 point each)

4. $b^{\frac{1}{3}}$

5. $a^{\frac{3}{5}}$

6. $36x^{\frac{1}{2}}$

7. $(27c)^{\frac{2}{3}}$

Write each expression in exponential form. (1 point each)

8. $\sqrt[3]{x^4}$

9. $\sqrt{(2y)^5}$

10. $\sqrt[3]{8z^4}$

7-6 Graphing Exponential Functions

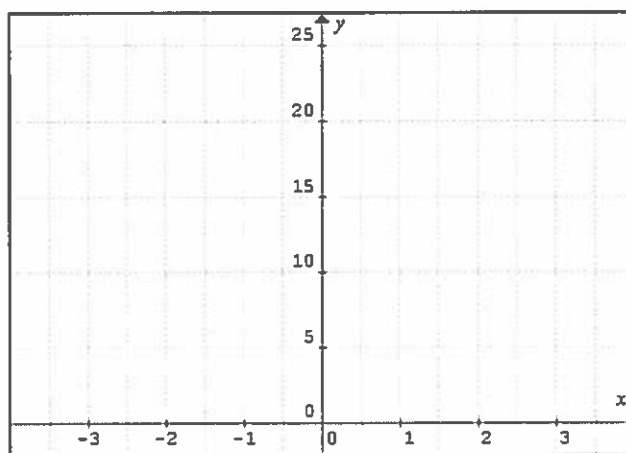
Determine whether each rule represents exponential growth or decay. Explain how you know.

1. $y = 4 \cdot 3^x$

(2)

3. Graph the exponential function $y = 3 \cdot 2^x$

x	Work	y
-2		
-1		
0		
1		
2		
3		



(4)

4. A computer valued at \$1900 loses 25% of its value each year.

a. Write a function rule that models the value of the computer.

b. Find the value of the computer after 3 years.

(1)

(1)

5. Suppose the population of a certain insect is modeled by the function $f(x) = 1600 \cdot 2^x$, where x is the number of years. How many insects will there be after 3 years? (Round to the nearest whole number)

(2)