Review for Test #2 - Scientific Notation

Name: _____ Class: _____

Write each number in scientific notation.

1.) 45,100,000

$$4.5 \cdot 10^7$$

2.) 0.00032

$$3.2 \cdot 10^{-4}$$

Write each number in standard notation.
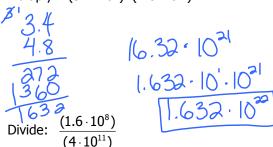
3.) 3.8×10^{-7}

0.00000038

4.) 2.15×10^5

215,000

5.) Write the following numbers in order from least to greatest.

$3.5 \cdot 10^8$, $3.9 \cdot 10^6$, $7.1 \cdot 10^6$ `

$3.9 \cdot 10^6$ _____ $7.1 \cdot 10^6$ _____ $3.5 \cdot 10^8$ _____

Explain how you know.

You go from lowest exponent to highest exponent when the exponents are the same, you go from lowest coefficient to highest exponent.

6.) Multiply: $(3.4 \cdot 10^8) \cdot (4.8 \cdot 10^{13})$

$$\begin{array}{r} \overset{3}{3}.\overset{1}{4} \\ 4.8 \\ \hline 272 \\ 1360 \\ \hline 1632 \end{array}$$

$16.32 \cdot 10^{21}$

$1.632 \cdot 10^1 \cdot 10^{21}$

$$\boxed{1.632 \cdot 10^{22}}$$

7.) Add: $(6.4 \cdot 10^9) + (8.2 \cdot 10^8)$

$$(6.4 \cdot 10^1 \cdot 10^8) + (8.2 \cdot 10^8)$$
$$64 \cdot 10^8 + 8.2 \cdot 10^8$$
$$72.2 \cdot 10^8 = 7.22 \cdot 10^1 \cdot 10^8 = \boxed{7.22 \cdot 10^9}$$

8.) Divide: $\dfrac{(1.6 \cdot 10^8)}{(4 \cdot 10^{11})}$

$$4 \overline{) 1.6} \quad \overset{.4}{}$$

$$0.4 \cdot 10^{-3}$$

$$4 \cdot 10^{-1} \cdot 10^{-3} = \boxed{4 \cdot 10^{-4}}$$

9.) Subtract: $2.8 \times 10^5 - 4.1 \times 10^3$

$$2.8 \cdot 10^2 \cdot 10^3 - 4.1 \cdot 10^3$$
$$280 \cdot 10^3 - 4.1 \cdot 10^3$$
$$275.9 \cdot 10^3$$
$$2.759 \cdot 10^2 \cdot 10^3$$
$$\boxed{2.759 \cdot 10^5}$$

$$\begin{array}{r} \overset{79}{2}\overset{10}{8}0.\overset{}{8} \\ - \quad 4.1 \\ \hline 275.9 \end{array}$$

10.) Which of the following is **not** equivalent to $2^4 \cdot 2^{-7}$?

(A) 2^{-3} (B) $\dfrac{1}{2^3}$ (C) $\dfrac{1}{8}$ (D) $\dfrac{1}{6}$

$$2^{-3} = \frac{1}{2^3} = \frac{1}{8}$$

11.) What is equivalent to $3^5 \cdot 3^{-8}$?

(B) -27 (B) $-\dfrac{1}{27}$ (C) $\dfrac{1}{27}$ (D) 27

$$3^{-3} = \frac{1}{3^3} = \frac{1}{27}$$

12.) A rectangular yard has a length of $4 \cdot 10^{-3}$ kilometer and a width of $6 \cdot 10^{-5}$ kilometer. Use scientific notation to express the area of the yard in square kilometers, showing each step in the process.

$$(4 \cdot 10^{-3})(6 \cdot 10^{-5})$$
$$24 \cdot 10^{-8} = 2.4 \cdot 10^1 \cdot 10^{-8} = \boxed{2.4 \cdot 10^{-7} \text{ Km}^2}$$

13.) If something grows at a rate of $8.4 \cdot 10^{-5}$ inches per year, how long will it be after it grows for $9.1 \cdot 10^7$ years?

$$(8.4 \cdot 10^{-5})(9.1 \cdot 10^7)$$
$$76.44 \cdot 10^2 \quad \text{in.}$$
$$7.644 \cdot 10^1 \cdot 10^2 = \boxed{7.644 \cdot 10^3}$$

$$\begin{array}{r} 8.4 \\ 9.1 \\ \hline 84 \\ 7560 \\ \hline 7644 \end{array}$$

14.) The SR-71 "Blackbird" one of the world's fastest airplanes. It is capable of cruising pseed of Mach 3, or three times the speed of sound. The speed of sound is approximately 7.6×10^2 miles per hour. How fast is the SR-71 capable of flying? Express your answer in scientific notation.

$$3(7.6 \cdot 10^2)$$
$$228 \cdot 10^2$$
$$2.28 \cdot 10^1 \cdot 10^2 = \boxed{2.28 \cdot 10^3 \text{ mph}}$$

$$\begin{array}{r} 7.6 \\ 3 \\ \hline 22.8 \end{array}$$

15.) Consider number A, which is 35,000,000, and number B, which is 7,000,000.

a) Write each number in scientific notation.

Number A: $3.5 \cdot 10^7$ Number B: $7 \cdot 10^6$

b) How many times larger is number A than number B?

$$\frac{3.5 \cdot 10^7}{7 \cdot 10^6} = 0.5 \cdot 10^1$$
$$= 5 \cdot 10^0 = 5$$
$$\boxed{5 \text{ times as large}}$$

16.) About $3.16 \cdot 10^8$ people live in the USA. About $1.357 \cdot 10^9$ people live in China. How many more people live in China than the USA?

$$1.357 \cdot 10^9 - 3.16 \cdot 10^8$$
$$1.357 \cdot 10^1 \cdot 10^8 - 3.16 \cdot 10^8$$
$$13.57 \cdot 10^8 - 3.16 \cdot 10^8$$
$$10.41 \cdot 10^8$$
$$1.041 \cdot 10^1 \cdot 10^8 = \boxed{1.041 \cdot 10^9}$$

$$\begin{array}{r} 13.57 \\ -3.16 \\ \hline 10.41 \end{array}$$