Name _____ Date _____

Scientific Notation Word Problems - Guided Lesson Explanation

Explanation#1

First we write the mass of Sun as $1.989x10^{30}$ and the mass of earth as $5.98x10^{24}$.

We have to subtract $5.98x10^{24}$ from $1.989x10^{30}$.

$1.989\times10^{30} - 5.98\times10^{24}$

1) If both numbers are multiplied by the same power of ten, it would just require us to subtract the numbers. We need to have these both in the same power of ten. We can convert the Earth's mass to 10^{30} by moving the decimal 6 places to the left:

0.00000598×10^{30}

Now that the two numbers are multiplied by the same power of ten, we can just perform simple subtraction of the root numbers and the final answer will be ten to the thirtieth power.

$$\begin{array}{r} 1.98900000 \\ -\ \underline{0.00000598} \\ = 1.98899402\times10^{30} \end{array}$$

So the answer is 1.98899402×10^{30}.

Explanation#2

First we write the population of Liverpool, $1.3x10^{4}$, and the population of Tamworth, $5.6x10^{3}$.

We can see that Liverpool is set to the higher power of ten and is, thus, the larger town.

To find the increased population we have to subtract the population of Tamworth from Liverpool.

$1.3x10^{4} - 5.6x10^{3}$

Get them into the same power of ten to make it workable. A nice way to do that is to move the decimal one to the right on Liverpool's population. This results in losing a power of ten.

$13.0 \times 10^3 - 5.6 \times 10^3$

Since they are multiplied by the same power, just subtract the root numbers.

$= 7.4 \times 10^3$

So the answer is 7.4×10^3.

Explanation#3

We have to calculate the amount spent per person on health care. We will divide 1.7 trillion by 290.9 million.

Million is 10^6 Trillion is 10^{12}

x = amount spent per person

$$x = \frac{1.7 \times 10^{12}}{290.9 \times 10^6}$$

$$x = \frac{17 \times 10^{11}}{2909 \times 10^5}$$

$$x = \frac{17}{2909} \times 10^{11-5} = .0058 \times 10^6$$

$= 5.8 \times 10^3$ or 5,800

So, the average amount spent per person on health care was $5,800.00.