Simplify:

$$\frac{3^{-2} \cdot 3^3}{3^{-1}} \qquad \frac{x^{-2} \cdot x^3}{x^{-1}}$$

Let get all exponents positive

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

$$= \frac{3^4}{3^2}$$

$$= 3^2$$

Homework Questions?

Please hand in your Scavenger Hunt work from yesterday if you did not already do so.

Let's solve some word problems with scientific notation!

Word Problem Key Words

Addition	Subtraction	Multiplication	Division
Add	By how much	Double, triple, etc...	Average
Added to	Change	In total (when a rate is involved)	Divided evenly
All together	Decreased by	Multiplied by	How many in each
And	Difference	Of	How many times bigger
Combined	Fewer	Product	How many times more
Gain	Greater than	Times	Per
In all	How many less	Total (groups)	Share equally
In total	How many more	Twice, three times, etc...	Split
Increase	How much left		
More	Left (leftover)		
Plus	Less		
Raise	Loss		
Sum of	Minus		
	Remaining		
	Reduce		
	Take away		

Word Problem 3-Reads

1st Read: What is the problem about?

2nd Read: What am I trying to figure out?

3rd Read: What is the important information in this problem?

Example 1

The population of Crowded Town is 4×10^6 and the population of Empty Village is 8×10^3. How much larger is Crowded Town than Empty Village?

2 towns & their populations

The population of Crowded Town is 4×10^6
and the population of Empty Village is 8×10^3.
How much larger is Crowded Town than Empty
Village?

usually the last sentence

How much larger Crowded town
is than Empty Village

The population of Crowded Town is 4×10^6 and the population of Empty Village is 8×10^3. How much larger is Crowded Town than Empty Village?

subtraction

$$4 \times 10^6 - 8 \times 10^3$$

$$4 \times 10^6 - 0.008 \times 10^6$$

$$3.992 \times 10^6 \quad \text{people}$$

Example 2

1st Read: What is the problem about?

The population of Crowded Town is 4×10^6 and the population of Empty Village is 8×10^3. How many times larger is the population of Crowded Town than Empty Village?

2 towns i their population

2nd Read: What am I trying to figure out?

The population of Crowded Town is 4×10^6 and the population of Empty Village is 8×10^3. How many times larger is the population of Crowded Town than Empty Village?

Last sentence

The population of Crowded Town is 4×10^6 and the population of Empty Village is 8×10^3. How many times larger is the population of Crowded Town than Empty Village?

Division

$$\frac{4 \times 10^6}{8 \times 10^3} = 0.5 \times 10^{3-1}$$

$$5 \times 10^2 \text{ times larger}$$

Example 3

1st Read: What is the problem about?

An airplane traveled 5.7×10^2 miles per hour for 2.0×10^1 hours. How far did the airplane travel?

Airplane traveling

2nd Read: What am I trying to figure out?

An airplane traveled 5.7×10^2 miles per hour for 2.0×10^1 hours. How far did the airplane travel?

Last sentence

An airplane traveled 5.7×10^2 miles per hour for 2.0×10^1 hours. How far did the airplane travel?

multiplication

$$\frac{5.7 \times 10^2 \text{ miles}}{\text{hour}} \cdot \frac{2.0 \times 10^1 \text{ hours}}{1}$$

$$11.4 \times 10^3 = 1.14 \times 10^4 \text{ miles}$$

Name _____ Period _____ Date _____

Scientific Notation Word Problems

Show all work as you solve the problems. **All final answer must be in correct scientific notation form.**

1. The approximate total surface area of Earth is 5.1×10^8 km². Salt water has an approximate surface area of 352,000,000 km² and freshwater has an approximate surface area of 9×10^6 km².

    a. How much of the Earth's surface is covered by water (salt and fresh combined)?

    b. How much of the Earth's surface is covered by land?

    c. Approximately how many times greater is the Earth's surface area that is covered by water, compared to the amount of the Earth's surface area that is covered by land?

2. Suppose there are 5×10^6 bacteria in every liter of water. How many bacteria are there in 12 liters of water?

3. A TV show had 3.5×10^6 viewers for their first episode and 8.5×10^6 viewers for their second episode. How many viewers did they have overall?

4. In 2013 the Los Angeles Dodgers opening day payroll was about 2.16×10^8 and the Houston Astros opening day payroll was about 2.4×10^7. How much higher was the Dodgers' payroll?

5. The population of the United States is 3×10^8 and the population of the world is 7×10^9. How many times larger is the population of the world than the U.S.?

Homework

Finish classwork