

WARMUP 1/(NUMBER OF LETTERS IN THIS SENTENCE)

*****ON YOUR WARMUP PAGE, JUST WRITE "NOTECARD"*****

Put your name.

No asking questions/no notes.

Hold it up when done!

Calculate. All answers must be in scientific notation.

1) $(2.84 \times 10^6)(3 \times 10^4)$

2) $(7.65 \times 10^5) - (1.4 \times 10^3)$

3)
$$\frac{4 \times 10^{50}}{8 \times 10^{47}}$$

Calculate. All answers must be in scientific notation.

1) $(2.84 \times 10^6)(3 \times 10^4)$

2) $(7.65 \times 10^5) - (1.4 \times 10^3)$

3) $\frac{4 \times 10^{50}}{8 \times 10^{47}}$

1) $2.84 \cdot 3 = 8.52$

$6 + 4 = 10$

8.52×10^{10}

2) 765000

$- 1400$

763600

7.636×10^5

3) $4 \div 8 = 0.5$

$50 - 47 = 3$

0.5×10^3

5×10^2

SOLVE BOTH WAYS

- A) By converting to standard form and using long division
- B) By using the shortcut

$$\frac{7.5 \times 10^8}{2.5 \times 10^3}$$

TEST FRIDAY

☐ **Exponent Rules**

☐ **Scientific Notation**

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- p. 5 Scientific Notation (1.6)
- p. 6 Calcluating with Scientific Notation (1.7)**

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TRY THESE...

*****If the coefficient is not between 1-10,
you must rewrite your answer!*****

1. $(8.1 \times 10^3)(6.4 \times 10^2)$

2. $\frac{1.2 \times 10^9}{1.5 \times 10^6}$

1. $8.1 \cdot 6.4 = 51.84$
 51.84×10^5
 $= 5,184,000$
 $= 5.184 \times 10^6$

2. $1.2 \div 1.5 = 0.8$
 0.8×10^3
 $= 800$
 $= 8 \times 10^2$

Adding & Subtracting in Scientific Notation

- ◉ **No shortcut:** convert both to standard notation, then add or subtract

(There is an exception to this rule - there IS a shortcut sometimes. When do you think that is?)

AN EXCEPTION...

You cannot combine these:

$$4x^3 + 7x^2$$

However, you can combine these:

$$4x^5 + 7x^5 \\ = 11x^5$$

$$\begin{array}{r} (6 \times 10^5) + (2 \times 10^3) \\ 600,000 \\ + \quad 2,000 \end{array}$$

The 6 and the 2 do not line up!

AN EXCEPTION...

In this scenario **ONLY**, the 6 and the 2 digits **WOULD** line up!

$$\begin{array}{r} (6 \times 10^7) + (2 \times 10^7) \\ 60,000,000 \\ + 20,000,000 \\ \hline 80,000,000 \\ = 8 \times 10^7 \end{array}$$

If the exponents are the same, you can use a shortcut for adding/ subtracting scientific notation. (Think of them as “combining like terms”)

$$\begin{array}{r} (6 \times 10^7) + (2 \times 10^7) \\ = 8 \times 10^7 \end{array}$$

Adding & Subtracting in Scientific Notation

- ⦿ No shortcut: convert both to standard notation, then add or subtract
- ⦿ **EXCEPTION: IF EXPONENTS ARE THE SAME**
 - Add/subtract coefficients
 - Keep the base AND keep the exponent

THE BOOK'S METHOD OF ADDING/SUBTRACTING:

Strategy 1:
Change both
to 4 exponent

$$\begin{aligned} & (4.56 \times 10^6) + (7 \times 10^4) \\ & (45.6 \times 10^5) + (7 \times 10^4) \\ & (456 \times 10^4) + (7 \times 10^4) \\ & = (463 \times 10^4) \\ & = (4.63 \times 10^6) \end{aligned}$$

Strategy 2:
Change both
to 6 exponent

$$\begin{aligned} & (4.56 \times 10^6) + (7 \times 10^4) \\ & (4.56 \times 10^6) + (.7 \times 10^5) \\ & (4.56 \times 10^6) + (.07 \times 10^6) \\ & = (4.63 \times 10^6) \end{aligned}$$

OVERALL MAIN IDEA IN MATH...

- ◉ You can multiply or divide anything.
- ◉ However, you can only add or subtract things that are like terms.
- ◉ Fractions work this way.
- ◉ Calculating with variables works this way.
- ◉ Scientific notation also works this way!

p.63 (1, 2, 4, 8) and p.65 (19, 21, 22)

1) 8.97×10^8

21) 1.334864×10^{10}

2) 3.762×10^{-7}

22) 1.115×10^5

(changed from 37.62×10^{-8})

4) 6.3×10^4

8) 9.563×10^{11}

19) 4×10^2

(changed from 0.4×10^3)

SCALE FOR THIS ASSIGNMENT:

-1	93
-2	85
-3	77
-4	70
-5	60
-6 or -7	50
NO WORK	0

OBJECTIVE:

Solve **story problems** involving adding, subtracting, multiplying, dividing scientific notation

YOU WILL BE WORKING WITH YOUR ELBOW PARTNER TODAY.

EVERY PAIR NEEDS:

- A calculator (either type)
- A whiteboard, marker, eraser to share

Switch off writers!

Help with the calculations when you're not the one writing.

Take turns using the calculator as well so you get practice with typing them in!

Find the perimeter and area of the square:



$$\text{Area} = l \cdot w$$

Sides are the same in a square so we usually write:

$$\text{Area} = s \cdot s$$

$$\text{Area} = s^2$$

$$A = 7^2$$

$$\mathbf{A = 49 \text{ in}^2}$$

$$\text{Perimeter} = s + s + s + s$$

$$\text{Perimeter} = 4s$$

$$P = 4 \cdot 7$$

$$\mathbf{P = 28 \text{ in}}$$

Find the perimeter and area of the square:

$5a^4$



$$\text{Area} = s^2$$

$$A = (5a^4)^2$$

$$\mathbf{A = 25a^8}$$

$$\text{Perimeter} = 4s$$

$$P = 4 \cdot 5a^4$$

$$P = 4 \cdot 5 \cdot a \cdot a \cdot a \cdot a$$

$$\mathbf{P = 20a^4}$$

Yes Calculator!!!

Add, subtract, multiply, or divide?

Find the area of the rectangle:

Multiply

$$2.05 \times 10^6$$

$$2.5 \times 10^3 \text{ cm}$$

$$8.2 \times 10^2 \text{ cm}$$



Yes Calculator!!!

Add, subtract, multiply, or divide?

Find the length of the rectangle:

Divide

$$2.5 \times 10^3$$

?

$$8.2 \times 10^2 \text{ cm}$$

$$A = 2.05 \times 10^6$$

Homework

Story Problem Worksheet

NOTE:

- Every answer **MUST** be in scientific notation.
- You may use a calculator on some of them – the sheet will tell you which ones