

# Warmup 1/(3 decades – 1 year)

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**\*\*\*Make sure you and your partner have a whiteboard, marker, eraser, and calculator.\*\*\***

For each, find the slope of the line between the points.

1) (3, 9) and (8, 5)

2) (-2, 10) and (4, -8)

3) (-6, 7) and (-6, 32)

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

1)  $8.97 \times 10^8$

21)  $1.334864 \times 10^{10}$

2)  $3.762 \times 10^{-7}$

22)  $1.115 \times 10^5$

(changed from  $37.62 \times 10^{-8}$ )

4)  $6.3 \times 10^4$

8)  $9.563 \times 10^{11}$

19)  $4 \times 10^2$

(changed from  $0.4 \times 10^3$ )

**SCALE FOR THIS ASSIGNMENT:**

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

# Partner Expectations

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- Take turns writing.
- Communicate. Work together, not separately.
- If it's not your turn to write, it's not break time for you. Contribute just as much verbally.
- It will say in the corner if calculator is allowed or not. If it is allowed, you should still show what you typed in on your whiteboard.

**No Calculator!!!**

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The bedroom of our house is 1,200 cubic meters. We know that there are  $3.4 \times 10^9$  particles of dust per cubic meter. How many particles of dust are in the bedroom of our house?

**1200 cubic meters; EACH ONE has  $3.4 \times 10^9$  particles → multiply!**

$$(1200) \cdot (3.4 \times 10^9)$$

$$(1.2 \times 10^3) \cdot (3.4 \times 10^9)$$

$$4.08 \times 10^{12} \text{ dust particles}$$

**Yes Calculator!!!**

## Story Problem

The distance from the Earth to the Sun is  $1.46 \times 10^8$  kilometers.  
The distance from the Earth to the Moon is  $3.84 \times 10^5$  kilometers.  
About how many times greater is the distance from the Earth to the Sun than the Earth to the Moon?

$$\frac{1.46 \times 10^8}{3.84 \times 10^5} = \underline{\hspace{2cm}}$$

$\approx 3.802 \times 10^2$  times greater

**Yes Calculator!!!**

## Story Problem

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In 2005,  $8.1 \times 10^{10}$  text messages were sent in the US. By 2007, the number of annual text messages had risen to  $3.63 \times 10^{11}$ . How many more texts were sent in 2007 than in 2005?

$$3.63 \times 10^{11} - 8.1 \times 10^{10} = \underline{\hspace{2cm}}$$

**$2.82 \times 10^{11}$  more texts**

**No Calculator!!!**

## Story Problem

The US Government spends about 4 trillion dollars per year. If a one dollar bill is 0.0001 meters thick, how many meters tall would a stack of 4 trillion one dollar bills be? (1 trillion =  $10^{12}$ )

$$(4 \times 10^{12}) \cdot (1 \times 10^{-4})$$



$$\begin{aligned} & 4 \times 10^8 \text{ meters} \\ &= 400,000,000 \text{ meters} \\ &= 400,000 \text{ kilometers} \\ &\approx 250,000 \text{ miles} \end{aligned}$$

**B) No Calculator!**

**C) Yes Calculator!**

## Story Problem

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The average human body cell is about  $5.1 \times 10^{-4}$  cm in diameter. The diameter of a plant cell is  $8 \times 10^{-3}$  cm.

A) Which cell is larger? *Plant cell*

B) What is the combined diameter of the body cell and the plant cell?  $0.00051 + 0.008 = 0.00851 = 8.51 \times 10^{-3}$

C) How many times larger is the plant cell than the body cell?

$$\frac{8 \times 10^{-3}}{5.1 \times 10^{-4}} \approx 1.6 \times 10^1 \approx 16 \text{ times larger}$$



**No Calculator!!!**

# National Debt Problem

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On February 2, 2010, the US Treasury estimated the national debt at  $\$1.2278 \times 10^{13}$ . The U.S. Census Bureau's estimate for the U.S. population was about  $3.086 \times 10^8$ . Using the estimates, how much money is this per person? **(For this problem only, you may round the estimates to help with your calculations)**

$$\frac{1.2278 \times 10^{13}}{3.086 \times 10^8} \longrightarrow \frac{1.2 \times 10^{13}}{3 \times 10^8} \longrightarrow \begin{array}{l} 0.4 \times 10^5 \\ 4 \times 10^4 \\ \$40,000 \end{array}$$

**No Calculator!!!**

# Distance/Rate/Time problem

The speed of light is  $3 \times 10^8$  meters per second. How many seconds does it take for light to reach the earth, if the sun is  $1.5 \times 10^{11}$  meters from earth? Write the answer in scientific notation.

$$\text{distance} = \text{rate} \times \text{time}$$

$$\text{time} = \frac{\text{distance}}{\text{rate}}$$

$$\frac{1.5 \times 10^{11}}{3 \times 10^8}$$

$$0.5 \times 10^3$$

$$500 \rightarrow 5 \times 10^2 \text{ seconds}$$

**No Calculator!!!**

# Distance/Rate/Time Problem

The speed of light is  $3 \times 10^8$  meters per second. It takes light about  $4.8 \times 10^3$  seconds to reach Saturn from the Sun. What is the distance between the sun and Saturn?

$$\text{distance} = \text{rate} \times \text{time}$$



$$d = (3 \times 10^8)(4.8 \times 10^3)$$



$$d = 14.4 \times 10^{11} \longrightarrow d = 1.44 \times 10^{12}$$

or 1,440,000,000,000 meters

# Homework

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## 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