

Lesson 12 Practice Problems

1. Which is larger: the number of meters across the Milky Way, or the number of cells in all humans? Explain or show your reasoning.

Some useful information:

- The Milky Way is about 100,000 light years across.
- There are about 37 trillion cells in a human body.
- $^{\circ}$ One light year is about 10^{16} meters.
- The world population is about 7 billion.

- 2. Write each number in scientific notation.
 - a. 14,700
 - b. 0.00083
 - c. 760,000,000
 - d. 0.038
 - e. 0.38
 - f. 3.8
 - g. 3,800,000,000,000
 - h. 0.0000000009



3. Perform the following calculations. Express your answers in scientific notation.

a.
$$(2 \times 10^5) + (6 \times 10^5)$$

b.
$$(4.1 \times 10^7) \cdot 2$$

c.
$$(1.5 \times 10^{11}) \cdot 3$$

d.
$$(3 \times 10^3)^2$$

e.
$$(9 \times 10^6) \cdot (3 \times 10^6)$$

- 4. Jada is making a scale model of the solar system. The distance from Earth to the Moon is about 2.389×10^5 miles. The distance from Earth to the Sun is about 9.296×10^7 miles. She decides to put Earth on one corner of her dresser and the Moon on another corner, about a foot away. Where should she put the sun?
 - On a windowsill in the same room?
 - In her kitchen, which is down the hallway?
 - A city block away?

Explain your reasoning.



5. Diego was solving an equation, but when he checked his answer, he saw his solution was incorrect. He knows he made a mistake, but he can't find it. Where is Diego's mistake and what is the solution to the equation?

$$-4(7 - 2x) = 3(x + 4)$$

$$-28 - 8x = 3x + 12$$

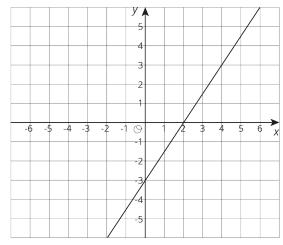
$$-28 = 11x + 12$$

$$-40 = 11x$$

$$-\frac{40}{11} = x$$

(From Unit 4, Lesson 13.)

6. Here is the graph for one equation in a system of equations.



- a. Write a second equation for the system so it has infinitely many solutions.
- b. Write a second equation whose graph goes through (0,2) so that the system has no solutions.
- c. Write a second equation whose graph goes through (2,2) so that the system has one solution at (4,3).

(From Unit 5, Lesson 13.)