Name _____   Date _____

1. Write the following in exponential form (e.g., $100 = 10^2$).

   a. 1000 = 10^3

   b. $10 \times 10 = 10^2$

   c. 100,000 = 10^5

   d. 100 x 10 = 10^3

   e. 1,000,000 = 10^6

   f. 10,000 × 10 = 10^5

2. Write the following in standard form (e.g., $4 \times 10^2 = 400$).

   a. $4 \times 10^3 = 4000$

   b. $64 \times 10^4 = 640000$

   c. $5300 \div 10^2 = 53$

   d. $5,300,000 \div 10^3 = 5300$

   e. $6.072 \times 10^3 = 6072$

   f. $60.72 \times 10^4 = 607200$

   g. $948 \div 10^3 = 0.948$

   h. $9.4 \div 10^2 = 0.094$

3. Complete the patterns.

   a. 0.02   0.2   __2__   20   __200__   __2000__

   b. 3,400,000   34,000   __340__   3.4   __0.034__

   c. __85700__   8,570   __857__   85.7   8.57   __0.857__

   d. 444   4440   44,400   __444000__   __4440000__   __44400000__

   e. __0.095__   9.5   950   95,000   __9500000__   __950000000__

Lesson 3: Use exponents to name place value units and explain patterns in the placement of the decimal point.

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4. After a lesson on exponents, Tia went home and said to her mom, "I learned that 10^4 is the same as 40,000." She has made a mistake in her thinking. Use words, numbers or a place value chart to help Tia correct her mistake.

Tia took the 4 and added 4 zeros. This is not the same as

$$10^4 = 10 \times 10 \times 10 \times 10 = 10000$$

5. Solve $247 \div 10^2$ and 247×10^2.

2.47   24700

a. What is different about the two answers? Use words, numbers or pictures to explain how the decimal point shifts.

Dividing by 100 makes the number smaller, so the decimal moves two spaces to the left.

Multiplying by 100 makes the number bigger, so the decimal moves two spaces to the right.

b. Based on the answers from the pair of expressions above, solve $247 \div 10^3$ and 247×10^3.

$$247 \div 10^3 = 0.247$$

$$247 \times 10^3 = 247000$$

Lesson 3: Use exponents to name place value units and explain patterns in the placement of the decimal point.

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