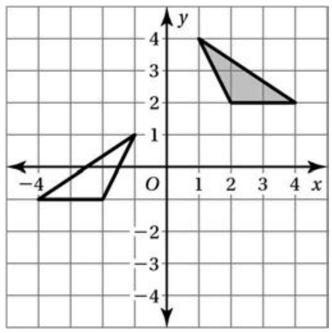
Lesson 7.6

Cumulative Practice

For use before Lesson 7.6

1. The gray figure is congruent to the white figure. Complete the description of a sequence of rigid motions between the figures.



One possible sequence of rigid motions is to reflect the gray figure in the *y*-axis and then translate the image _____ units down.

Lesson 7.6

Vocabulary Practice

For use before Lesson 7.6

1. Write what you know about this word.

Review: image

Lesson 7.6

Prerequisite Skills Practice

For use before Lesson 7.6

Evaluate the expression.

1. $\frac{3^6}{3^6}$

2. $7^0 \cdot 7^2$

3. $\frac{-2^6}{-2^6}$

4. $5^3 \cdot 5^{-3}$

5. $9^0 \cdot 9^3$

6. $(-3)^3 \cdot (-3)^{-3}$

Name ______________________________ Date __________

Lesson 7.6 Extra Practice

Write the number in scientific notation.

1. 350,000
2. 0.0004
3. 0.000000000000527
4. 12,500,000
5. 1,900,000,000
6. 0.0000001
7. 5,000,000,000,000
8. 0.00006524

Write the number in standard form.

9. 8×10^{6}
10. 6×10^{8}
11. 3.1×10^{4}
12. 4×10^{-3}
13. 8.42×10^{-6}
14. 3.345×10^{8}

15. The ångström is a unit of length defined to be 0.1 nanometer or 0.0000000001 meter. Write these numbers in scientific notation.

16. In 2017, the net worth of a businessman was $59,000,000. Write this number in scientific notation.

17. The thickness of a science specimen is 3.5×10^{-3} feet. Write this number in standard form. Then write your answer using inches.

Name____ Date__________

Lesson 7.6 Reteach

A number is written in **scientific notation** when it is represented as the product of a factor and power of 10. The factor must be greater than or equal to 1 and less than 10.

The factor is greater than or equal to 1 and less than 10. → 8.3×10^{-7} ← The power of 10 has an integer exponent.

Key Idea

Writing Numbers in Scientific Notation

Move the decimal point so it is located to the right of the leading nonzero digit. The number of places you moved the decimal point indicates the exponent of the power of 10, as shown below.

Number Greater Than or Equal to 10

Use a positive exponent when you move the decimal point to the left.

$$\underbrace{8600}_{3} = 8.6 \times 10^3$$

Number Between 0 and 1

Use a negative exponent when you move the decimal point to the right.

$$0.\underbrace{0024}_{3} = 2.4 \times 10^{-3}$$

EXAMPLE Writing Numbers in Scientific Notation

a. Write 69,000,000 in scientific notation.

Move the decimal point 7 places to the left. → $\underbrace{69{,}000{,}000}_{7} = 6.9 \times 10^7$ ← The number is greater than 10. So, the exponent is positive.

b. Write 0.000071 in scientific notation.

Move the decimal point 5 places to the right. → $0.\underbrace{000071}_{5} = 7.1 \times 10^{-5}$ ← The number is between 0 and 1. So, the exponent is negative.

Name ______________________________ Date __________

Lesson 7.6

Reteach (continued)

Key Idea

Writing Numbers in Standard Form

The absolute value of the exponent indicates how many places to move the decimal point.

- If the exponent is negative, move the decimal point to the left.
- If the exponent is positive, move the decimal point to the right.

EXAMPLE Writing Numbers in Standard Form

a. Write 4.81×10^{-5} in standard form.

$4.81 \times 10^{-5} = 0.\underbrace{00004}_{5}81$ Move the decimal point $|-5| = 5$ places to the left.

b. Write 2.5×10^{7} in standard form.

$2.5 \times 10^{7} = 2\underbrace{5{,}000{,}000}_{7}$ Move the decimal point $|7| = 7$ places to the right.

Write the number in scientific notation.

1. 575,000,000

2. 87,900,000,000

3. 62,000

4. 0.000098

5. 0.00046

6. 0.0000000032

Write the number in standard form.

7. 8.2×10^{-6}

8. 5.9×10^{-3}

9. 2.912×10^{-7}

10. 9.87×10^{6}

11. 3.7×10^{4}

12. 2.889×10^{7}

Name____ Date__________

Lesson 7.6

Enrichment and Extension

Avogadro's Number

The mass of an atom is too small to measure with grams or milligrams. Scientists use *atomic mass units* (amu) to describe the mass of an atom. The number of atomic mass units in one gram is a constant known as Avogadro's number.

$1 \text{ g} \approx 6.022 \times 10^{23} \text{ amu}$
$1.661 \times 10^{-24} \text{ g} \approx 1 \text{ amu}$

1. Copy and complete the table.

Element	Chemical Symbol	Mass (amu)	Mass (g)
Silver	Ag	1.26×10^{25}	
Oxygen	O		28
Platinum	Pt	9.64×10^{24}	
Helium	He	3.01×10^{22}	
Nitrogen	N		34

2. Arrange the chemical symbols in order of increasing mass. What word do the symbols spell?

Name ____ Date __________

7.6 Puzzle Time

If A Man Wears Pajamas What Does A Woman Wear?

Write the letter of each answer in the box containing the exercise number.

1. Write 102,800,000 in scientific notation.

A. 1.028×10^{8} **B.** 1028×10^{5} **C.** 1×10^{8}

2. Write 0.0000522 in scientific notation.

Q. 5.22×10^{5} **R.** 5.22×10^{-4} **S.** 5.22×10^{-5}

3. Write –0.32 in scientific notation.

A. -3.2×10^{-1} **B.** -3.2×10^{0} **C.** -32×10^{-2}

4. Write 420,000,000,000 in scientific notation.

L. 42×10^{10} **M.** 4.2×10^{11} **N.** 4.2×10^{8}

5. Write 0.000006 in scientific notation.

A. 6×10^{-6} **B.** 6×10^{-7} **C.** 6×10^{-8}

6. A movie earned \$1,845,000,000 at the box office. What is the dollar amount written in scientific notation?

J. 1.845×10^{9} **K.** 18.45×10^{8} **L.** 1.845×10^{6}

7. The volume of a cylinder with radius $r = 1.5 \times 10^{-4}$ inch and height $h = 2.4 \times 10^{-3}$ inch is 0.00000000017 cubic inch. Write the volume of the cylinder in scientific notation.

L. 1.7×10^{-9} cubic inch **M.** 1.7×10^{-10} cubic inch **N.** 1.7×10^{-11} cubic inch

7	5	6	3	4	1	2