Name _____ Date _____ Class _____

LESSON 15-4

Operations with Scientific Notation

Practice and Problem Solving: A/B

Add or subtract. Write your answer in scientific notation.

1. $6.4 \times 10^3 + 1.4 \times 10^4 + 7.5 \times 10^3$

_____

2. $4.2 \times 10^6 - 1.2 \times 10^5 - 2.5 \times 10^5$

_____

3. $3.3 \times 10^9 + 2.6 \times 10^9 + 7.7 \times 10^8$

_____

4. $8.0 \times 10^4 - 3.4 \times 10^4 - 1.2 \times 10^3$

_____

Multiply or divide. Write your answer in scientific notation.

5. $(3.2 \times 10^8)(1.3 \times 10^9) =$ _____

6. $\frac{8.8 \times 10^7}{4.4 \times 10^4} =$ _____

7. $(1.5 \times 10^6)(5.9 \times 10^4) =$ _____

8. $\frac{1.44 \times 10^{10}}{2.4 \times 10^2} =$ _____

Write each number using calculator notation.

9. $4.1 \times 10^4 =$ _____

10. $9.4 \times 10^{-6} =$ _____

Write each number using scientific notation.

11. 5.2E–6 = _____

12. 8.3E+2 = _____

Use the situation below to complete Exercises 13–16. Express each answer in scientific notation.

A runner tries to keep a consistent stride length in a marathon. But, the length will change during the race. A runner has a stride length of 5 feet for the first half of the race and a stride length of 4.5 feet for the second half.

13. A marathon is 26 miles 385 yards long. That is about 1.4×10^5 feet. How many feet long is half a marathon?

_____

14. How many strides would it take to finish the first half of the marathon?

_____

15. How many strides would it take to finish the second half of the marathon?

_____

Hint: Write 5 ft as 5.0×10^0 and 4.5 feet as 4.5×10^0.

16. How many strides would it take the runner to complete marathon? Express your answer in both scientific notation and standard notation.

_____

Name _____ Date _____ Class _____

LESSON 15-4

Operations with Scientific Notation

Reteach

To add or subtract numbers written in scientific notation:

Check that the exponents of powers of 10 are the same.
If not, adjust the decimal numbers and the exponents.
Add or subtract the decimal numbers.
Write the sum or difference and the common power of 10 in scientific notation format.
Check whether the answer is in scientific notation.
If it is not, adjust the decimal and the exponent.

$(a \times 10^n) + (b \times 10^n) = (a + b) \times 10^n$
$(a \times 10^n) - (b \times 10^n) = (a - b) \times 10^n$

$(1.2 \times 10^5) - (9.5 \times 10^4)$
$(1.2 \times 10^5) - (0.95 \times 10^5)$ ← Adjust to get same exponent.
$(1.2 - 0.95) \times 10^5$
0.25×10^5 ← Not in scientific notation.
2.5×10^4 ← Answer

To multiply numbers written in scientific notation:

Multiply the decimal numbers.
Add the exponents in the powers of 10.
Check whether the answer is in scientific notation.
If it is not, adjust the decimal numbers and the exponent.

$(a \times 10^n) \times (b \times 10^m) = ab \times 10^{n+m}$

$(2.7 \times 10^8) \times (8.9 \times 10^4)$
$(2.7 \times 8.9) \times 10^{8+4}$
24.03×10^{12} ← Not in scientific notation.
2.403×10^{13} ← Answer

To divide numbers written in scientific notation:

Divide the decimal numbers.
Subtract the exponents in the powers of 10.
Check whether the answer is in scientific notation.
If it is not, adjust the decimal numbers and the exponent.

$(a \times 10^n) \div (b \times 10^m) = a \div b \times 10^{n-m}$

$(6.3 \times 10^7) \div (9.0 \times 10^3)$
$(6.3 \div 9.0) \times 10^{7-3}$
0.7×10^4 ← Not in scientific notation.
7.0×10^3 ← Answer

Compute. Write each answer in scientific notation.

1. $(2.21 \times 10^7) \div (3.4 \times 10^4)$ _____

2. $(5.8 \times 10^6) - (4.3 \times 10^6)$ _____

3. $(2.8 \times 10^3)(7.5 \times 10^4)$ _____