

5/11/17 CCM6+7+

Use scientific notation and apply it to real-world contexts to solve problems.

1. Agenda...HW is SG pages 25-28...EOG RP...
TEST 14 TUESDAY

2. No warm-ups today...finish QUIZ

Unit 14 QUIZ-Exponent Simplification Name 6 Date _____
 CCM6+7+ 2016-17

$3m^2 \cdot 5m^4$ $15m^6$	$2a^2b^1 \cdot 4ab^{-2}$ $\frac{8a^3 \cancel{b^1}}{\cancel{2a^1} b}$	$\frac{6a^2b^3}{2ab^4}$ $\frac{3a^1b^1}{3a^1b^3}$
$(2x^3y^{-2})^{-1}$ $\frac{1}{2x^3y^{-2}}$ $\frac{y^2}{2x^3}$	$\frac{\cancel{2} \cancel{16} d^2 e^{-4} f}{\cancel{3} \cancel{24} d^2 e f^{-1}}$ $\frac{\cancel{2} d^1 \cancel{e^{-4}} f^2}{\cancel{3} e^5}$	$\left(\frac{2x^2y^3}{4xy^4}\right)^{-2}$ $\left(\frac{\cancel{2}x^2y^3}{\cancel{4}xy^4}\right)^2$ $2 \cdot x^{-1.2} \cdot y^{1.2}$ $\frac{4 \cdot x^{-2} \cdot y^2}{x^2}$

✓ HW

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Compute the EXACT answer to each of the following questions giving your answer in scientific notation.

1. $(3 \times 10^{-6})(3 \times 10^9)$

$$(3 \times 3)(10^{-6+9})$$

$$9 \times 10^3$$

2. $\frac{6.8 \times 10^9}{2 \times 10^5}$

$$(6.8 \div 2)(10^{9-5})$$

$$3.4 \times 10^4$$

3. $4.5 \times 10^7 + 41,000,000$

$$4.1 \times 10^7$$

$$8.6 \times 10^7$$

4. $8.4 \times 10^7 - 3.1 \times 10^7$

$$5.3 \times 10^7$$

5. $(2.4 \times 10^4)(3,000)$

$$\checkmark \frac{5.4 \times 10^8}{3,000}$$

7. $3.9 \times 10^{13} + 4.2 \times 10^{13}$

$$\checkmark 8.2 \times 10^{-5} - 0.000059$$

9. $(1.3 \times 10^{-4})(4.2 \times 10^{11})$

10. $\frac{4.5 \times 10^9}{1.5 \times 10^{13}}$

11. $1.3 \times 10^7 + 4 \times 10^7$

12. $5.2 \times 10^7 - 12,000,000$

REAL WORLD APPLICATION

1) a. You are supposed to go to Idaho. It is 50 miles from here to Ogden. Then it is 90 miles to Pocatello Idaho from Ogden. How far must you go?

b. You are supposed to go Venus. The earth is 9.3×10^7 miles from the sun. Venus is 8.5×10^7 miles from the sun. How far is it to Venus?

$(9300000 - 8.5) \times 10^7 = 9299915 \times 10^7$

2) a. You can travel 70 miles in one hour. How many hours will it take to get to Pocatello from Salt Lake City?

b. You can travel 5.88×10^{12} miles in one light year. How many years will it take you to get to Venus?

3) a. The teeth of a comb are 3 millimeters wide. There are 45 teeth. How long is the comb?

b. A centipede's leg is 7.23×10^{-2} cm. There are 50 legs on a side. How long is the centipede?

$.0723 \times 50 = 3.615 \text{ cm}$

4) a. A bracelet weighs 8 oz. How many bracelets are in box which weighs a pound?

b. A grasshopper weighs 5.88×10^{-2} ounces. How many grasshoppers are in a pound? (a pound has 16 ounces)

5) Some stars in the Milky Way are 8×10^4 light years away.

Write this number in standard (expanded) form.

Why might scientists prefer to use this number in scientific notation?

6) A light year is 5.88×10^{12} miles.

Write this number in standard form.

5,880,000,000,000

- 7) How many miles is it to the stars in the Milky Way: You'll need the information in questions 1 and 2 to answer this question. Show your work, including what you make the calculator do.

Write your answer in scientific notation.

- 8) If one eyelash measures 1.19×10^{-2} cm in diameter, and if your eyelashes lined up side by side in your eyelid which measures 3 cm, how many eyelashes could fit on one eyelid?

✓ Write your answer in standard form. $3 \div .0119 = 252$

✓ Write your answer in scientific notation. 2.52×10^2

If you lose 5 eyelashes per day, per eye, what percent of your total eyelashes are you losing per day?

- 9) A house spider weighs 4.22×10^{-3} ounces. How many house spiders are there in a pound? Note: there are 16 oz. in one pound. Show your work, including what you make the calculator do.

HW

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Unit 14 Study Guide

EXPONENTS REVIEW

- Any number to the power of zero always equals _____ because _____.
- If a number has a negative exponent, just _____.
- If two numbers with the same base are multiplying, just _____ the exponents.
- If two numbers with the same base are dividing, just _____ the exponents.
- If an exponent is beside a set of parentheses, just _____ it with the exponents inside the parentheses.
- If a negative sign is in front of parentheses that have an exponent outside, where does it fall in the order of operations?
- If a negative sign is inside parentheses that have an exponent outside, where does it fall in the order of operations?

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- _____ 8. $(-8.6)^0$

a. -1 b. 0 c. -8.6 d. 1
- _____ 9. $-(6)^{-1}$

a. 6 b. $-\frac{1}{-1^6}$ c. $\frac{1}{6}$ d. $-\frac{1}{6}$
- _____ 10. $(4)^{-2}$

a. $-\frac{1}{16}$ b. 16 c. $\frac{1}{16}$ d. -8
- _____ 11. $\frac{12}{c^{-8}d^2}$

a. $\frac{12}{cd^{-6}}$ b. $\frac{96c}{d^2}$ c. $\frac{12}{c^8d^2}$ d. $\frac{12c^8}{d^2}$

HW

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_____ 12. $7x^{-8} \cdot 6x^3$

a. $\frac{42}{x^5}$ b. $\frac{1}{42x^5}$ c. $42x^{11}$ d. $13x^{-5}$

_____ 13. $(5k^2)^3$

a. $125k^6$ b. $125k^5$ c. $5k^6$ d. $5k^8$

_____ 14. $\frac{x^{14}}{x^7}$

a. x^7 b. x^{98} c. $\frac{1}{x^7}$ d. x^{21}

_____ 15. $\left(\frac{3x}{2}\right)^4$

a. $\frac{81x^4}{16}$ b. $6x^4$ c. $\frac{12x^4}{8}$ d. $\frac{81x^4}{2}$

_____ 16. $(b^4)^6 \cdot (b^2)^4$

a. b^{192} b. b^{32} c. $2b^{32}$ d. b^{15}

_____ 17. $\frac{8b^3}{20b^3}$

a. $\frac{2}{5}$ b. $\frac{2}{5}b$ c. $4\frac{1}{2}$ d. $\frac{8}{28}b^6$

SIMPLIFY. Pay attention to what you wrote above in the exponents review!

18. $7^2 \cdot 7^5$

19. $a^2b \cdot a^3b^4$

20. $\frac{m^4n^{-3}}{m^{-2}n}$

21. $-(r^5s^4)^0$

22. $\frac{x^5y^2}{x^{-1}y^2}$

23. $-2 \left(\frac{2x^{-3}y^{-1}}{4x^2y^{-3}} \right)^3$ ^{exponent} ↙

HW

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SCIENTIFIC and STANDARD NOTATION—write the number in its equivalent *other* form.

24. $8,030,000,000 =$ _____

25. $8.6 \times 10^{-7} =$ _____

26. $8.72 \times 10^5 =$ _____

27. $0.0000073 =$ _____

Put in order from least to greatest.

28. $72 \times 10^5, 6.9 \times 10^6, 23 \times 10^5$

29. $19 \times 10^{-3}, 2.5 \times 10^{-4}, 1.89 \times 10^{-4}$

Solve. Express your result in scientific notation.

30. $9.7821 \times 10^{-17} + 3.14 \times 10^{-18}$

31. $1.824 \times 10^4 - 3.821 \times 10^2$

32. $(1.5 \times 10^5)(4 \times 10^9)$

32. $(5.1 \times 10^3)(1.63 \times 10^{-5})$

____ 33. Which number is written in scientific notation?

a. 7.8×10^{-5}

b. 3.4×100^2

c. 0.84×10^6

d. -5×10^{-12}

____ 34. Which number is NOT written in scientific notation?

a. 3×10^{-8}

b. 6.7×10^3

c. 8.7×10^{-5}

d. 25.67×10^{-2}

____ 35. 0.0805

a. 80.5×100^{-3}

b. 8.05×10

c. 0.805×10^{-1}

d. 8.05×10^{-2}

HW

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- ____ 36. 9×10^4
 a. 9,000 b. 90^4 c. 90,000 d. 360
- ____ 37. Order 3.21×10^6 , 42×10^4 , and 0.11×10^{10} from least to greatest.
 a. 3.21×10^6 , 42×10^4 , 0.11×10^{10} c. 42×10^4 , 0.11×10^{10} , 3.21×10^6
 b. 42×10^4 , 3.21×10^6 , 0.11×10^{10} d. 0.11×10^{10} , 3.21×10^6 , 42×10^4
- ____ 38. Which list shows the numbers in order from least to greatest?
 a. 5.4×10^4 , 5.4×10^3 , 4.5×10^4 c. 5.4×10^3 , 5.4×10^4 , 4.5×10^4
 b. 5.4×10^3 , 4.5×10^4 , 5.4×10^4 d. 4.5×10^4 , 5.4×10^3 , 5.4×10^4
- ____ 39. $(9 \times 10^7)(7 \times 10^9)$
 a. 6.3×10^{64} b. 6.3×10^{17} c. 1.6×10^{64} d. 1.6×10^{17}
- ____ 40. $(0.4 \times 10^{-6})(0.7 \times 10^{-2})$
 a. 2.8×10^{-9} b. 2.8×10^{-8} c. 2.8×10^{-7} d. 0.28×10^{-9}
- ____ 41. The diameter of Mercury is about 3.0×10^3 miles. The diameter of Jupiter, the largest planet, is about 8.8×10^4 miles. What is the difference between the diameters of these planets expressed in scientific notation?
 a. 5.8×10^7 miles c. 8.5×10^2 miles
 b. 5.8×10^1 miles d. 8.5×10^4 miles
- ____ 42. The masses of four objects were measured during a physics experiment. The first and the last objects each had a mass of 41.918 g. The second and the third objects each had a mass of 24.83 g. Find the total mass of the four objects. Write your answer in scientific notation.
 a. 1.33496×10^2 g c. 1.33596×10^3 g
 b. 1.33496×10^4 g d. 1.33496×10 g