



Pre-Algebra Workbook

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MATH

NUMBER SETS

- 1. The number 0 is included in all the number sets except _____ numbers.
- 2. Positive and negative whole numbers are called _____.
- 3. Fractions and decimals can be considered _____ numbers.
- 4. The number set $\{2,4,6,8\}$ shows a set of _____ numbers.
- 5. What is the real number that's halfway between 1 and 2?
- 6. The number sets that include negative numbers are _____, _____, _____, and _____ numbers.



IDENTITY NUMBERS

- 1. Find the sum.

$$4 + 0 =$$

- 2. Find the product.

$$15 \cdot 1$$

- 3. The identity number for addition is 0 because when we add 0 to a number the value does _____ change.

- 4. The _____ number for multiplication is 1 because when we multiply a number by 1, the value does not change.

- 5. Given the problem $10 + 0 = 10$, the 0 is the identity number for _____.

- 6. Given the problem $20 \cdot 1 = 20$, the 1 is the identity number for _____.



OPPOSITE OF A NUMBER

- 1. What is the opposite of -15 ?

- 2. What is the opposite of $2/3$?

- 3. Opposites are numbers that are equal distance from _____.

- 4. What is the only number that is its own opposite?

- 5. When looking at a number line, the negative numbers are to the _____ of 0 and the positive numbers are to the _____ of 0.

- 6. We know 5 and -5 are opposite numbers because they are both _____ units away from 0.



ABSOLUTE VALUE

- 1. Simplify the expression.

$$|-4|$$

- 2. Simplify the expression.

$$|75|$$

- 3. Write the numbers from least to greatest.

$$|-4|, |1|, |0|, |-8|, |9|$$

- 4. Write the values from greatest to least.

$$|7|, |-3|, |0|, |-9|, |5|$$

- 5. Absolute values make positive numbers _____ and negative numbers _____.

- 6. Simplify the expression.



$$|-3|$$



ADDING AND SUBTRACTING SIGNED NUMBERS

- 1. Simplify the expression.

$$-4 + 2$$

- 2. Simplify the expression.

$$-11 - 8$$

- 3. When we add two negative numbers, we'll always get a _____ number.

- 4. Simplify the expression.

$$-19 - 26$$

- 5. Simplify the expression.

$$5 - 8$$

- 6. Simplify the expression.



$$3 - (-6)$$



MULTIPLYING SIGNED NUMBERS

■ 1. Multiplying two negative numbers will always result in a _____ number.

■ 2. Multiplying a negative and a positive number will always result in a _____ number.

■ 3. Multiplying two positive numbers will always result in a _____ number.

■ 4. Simplify the expression.

$$12 \cdot -5$$

■ 5. Simplify the expression.

$$-8 \cdot -6$$

■ 6. Simplify the expression.

$$25 \cdot 3$$



DIVIDING SIGNED NUMBERS

■ 1. Dividing a negative number by a negative number will always result in a _____ number.

■ 2. Dividing a positive number by a negative number will always result in a _____ number.

■ 3. Simplify the expression.

$$-12 \div 2$$

■ 4. Simplify the expression.

$$0 \div -8$$

■ 5. Simplify the expression.

$$24 \div -6$$

■ 6. Simplify the expression.



$$-144 \div -12$$



ABSOLUTE VALUE OF AN EXPRESSION

- 1. Simplify the expression.

$$|-6| + |-5 \cdot 2|$$

- 2. Simplify the expression.

$$|-6| - |7|$$

- 3. Simplify the expression.

$$|-5 \cdot 4|$$

- 4. Simplify the expression.

$$|-5 \cdot -4 \cdot 2|$$

- 5. Simplify the expression.

$$|-11 + 3| \cdot |-9|$$

- 6. Simplify the expression.



$$|-8-2| \cdot |-4-3|$$



DIVISIBILITY

- 1. Is 369 divisible by 3?
- 2. How can we determine if a number is divisible by 5?
- 3. “Divisibility” of whole numbers means we’re looking at numbers that divide into a number _____.
- 4. Is 245 divisible by 7?
- 5. What is the smallest whole number larger than 20 that’s divisible by 2 and 4?
- 6. What is the smallest whole number larger than 50 that’s divisible by both 3 and 5?



MULTIPLES

- 1. List the first four multiples of 8.

- 2. List the first five multiples of 40.

- 3. Is 8 a multiple of 8? Why or why not?

- 4. What are two common multiples of 2 and 3?

- 5. What are two common multiples of 5 and 10?

- 6. The concept of multiples is related to the concept of _____.



PRIME AND COMPOSITE

- 1. _____ numbers are numbers that are divisible by numbers other than 1 and themselves.
- 2. Is 7 a prime or composite number?
- 3. Is 15 a prime or composite number?
- 4. 35 is a composite number because it's divisible by which numbers?
- 5. 98 is a composite number because it's divisible by which numbers?
- 6. By how many numbers will a prime number be divisible?



PRIME FACTORIZATION AND PRODUCT OF PRIMES

- 1. What is the prime factorization of 75?

- 2. What is the prime factorization of 55?

- 3. What is the prime factorization of 148?

- 4. The prime factorization of 156 is $2 \cdot 2 \cdot 3 \cdot$ _____.

- 5. The prime factorization of 63 is $3 \cdot 3 \cdot$ _____.

- 6. Prime factorization is when we break down a composite number into its factors until every factor is a _____ number.



LEAST COMMON MULTIPLE

- 1. Find the least common multiple of 3 and 15.
- 2. Find the least common multiple of 16 and 40.
- 3. Find the least common multiple of the set {36, 84}.
- 4. Find the least common multiple of 12 and 20.
- 5. If the prime factorization of one number is $2 \cdot 3 \cdot 5^2$, and the prime factorization of another is $2^3 \cdot 3$, what's the least common multiple of the two numbers?
- 6. Is there only one possible pair of two numbers that can have a LCM of 20? Give examples to support the answer.



GREATEST COMMON FACTOR

- 1. The greatest common factor of two numbers is the _____ number that divides evenly into both numbers.
- 2. Find the greatest common factor of 100 and 75.
- 3. Find the greatest common factor of the set {54, 162}.
- 4. If one number has a prime factorization of $3 \cdot 5 \cdot 11$, while another has a prime factorization of $2 \cdot 3^2 \cdot 11^2$, what is their greatest common factor?
- 5. If one number has a prime factorization of $2^4 \cdot 3 \cdot 11$, while another has a prime factorization of $2^3 \cdot 5$, What is their greatest common factor?
- 6. Is there only one possible pair of two numbers that can have a GCF of 16? Give examples to support the answer.



FRACTIONS

- 1. What is the denominator of the fraction $\frac{3}{5}$?
- 2. How would we write 40 % as a fraction?
- 3. How would we write 75 % as a fraction?
- 4. If a pizza is cut into 6 equal pieces and Ben eats 2 of them, what fraction of the pizza did Ben eat?
- 5. Hazel is cleaning out her closet. She has 8 sweaters and 2 of them are blue. What fraction of her sweaters are blue?
- 6. Joey cuts a pie into 10 equal slices and eats 1 slice. What fraction of the pie did he eat?



SIMPLIFYING FRACTIONS AND EQUIVALENT FRACTIONS

- 1. Write $20/50$ as a simplified fraction.
- 2. Write the fraction $4/5$ in terms of 20ths.
- 3. Write $110/154$ as a simplified fraction.
- 4. Are the fractions $3/15$ and $6/36$ equivalent?
- 5. Are the fractions $2/16$ and $4/32$ equivalent?
- 6. When using prime factorization to reduce fractions, we're looking for the numbers in the numerator and denominator that are the _____ prime number.



DIVISION OF ZERO

- 1. The fraction $0/7$ means _____ divided by _____.
- 2. The number _____ can never be the denominator of a fraction.
- 3. The fraction $0/8$ has a value of _____.
- 4. True or false? $5/0$ has a value of 0.
- 5. Complete the statement.

.....

$$6 \cdot 0 = 0 \text{ and } 0 \div 6 = \underline{\hspace{2cm}}.$$

- 6. Complete the statement of why we can't divide by 0.

$7 \div 0$ means that that something times 0 has a value equal to 7. But there's nothing times 0 that will ever equal 7 because anything times 0 will always equal _____. Therefore, it's impossible to divide by 0.



ADDING AND SUBTRACTING FRACTIONS

- 1. When we add or subtract fractions, we'll add or subtract the _____ and the _____ will stay the same.

- 2. Find the sum.

$$\frac{1}{9} + \frac{3}{9}$$

- 3. Find the difference.

$$\frac{7}{12} - \frac{2}{6}$$

- 4. Find the sum.

$$\frac{1}{16} + \frac{3}{4} + \frac{5}{8}$$

- 5. Simplify the expression.

$$\frac{7}{10} - \frac{1}{10} + \frac{2}{5}$$



■ 6. Simplify the expression.

$$\frac{2}{15} + \frac{1}{5} - \frac{1}{30}$$



MULTIPLYING AND DIVIDING FRACTIONS

■ 1. When we're dividing fractions, we need to flip the _____ fraction.

■ 2. Simplify the expression.

$$\frac{4}{7} \cdot \frac{2}{9}$$

■ 3. Simplify the expression.

$$\frac{5}{8} \div \frac{1}{12}$$

■ 4. Simplify the expression.

$$\frac{2}{9} \div \frac{1}{15}$$

■ 5. Simplify the expression.

$$\frac{1}{10} \cdot \frac{2}{5} \div \frac{1}{4}$$



■ 6. Simplify the expression.

$$\frac{3}{5} \div \frac{1}{6} \cdot \frac{4}{9}$$



SIGNS OF FRACTIONS

- 1. Is the statement true or false?

$$-\frac{1}{6} \text{ is equivalent to } \frac{-6}{1}.$$

- 2. Is the statement true or false?

$$-\frac{3}{4} \text{ is equivalent to } \frac{3}{-4}.$$

- 3. Simplify the expression.

$$\frac{2}{11} \cdot -\frac{1}{4}$$

- 4. Simplify the expression.

$$-\frac{3}{20} \cdot -\frac{2}{13}$$

- 5. Simplify the expression.

$$\frac{4}{7} \div -\frac{3}{11}$$



■ 6. If the numerator and the denominator are both negative, the fraction will be _____.



RECIPROCAL

- 1. A reciprocal is what we get when we _____ the fraction.
- 2. What is the reciprocal of $-1/2$?
- 3. What is the reciprocal of 3?
- 4. What is the reciprocal of $-1/4$?
- 5. The only number that does not have a reciprocal is _____.
- 6. When we multiply two numbers that are reciprocals of one another, the result is always _____.



MIXED NUMBERS AND IMPROPER FRACTIONS

■ 1. Mixed numbers are a representation of what operation (addition, subtraction, multiplication, division)?

■ 2. Convert $15/4$ into a mixed number.

■ 3. Convert $34/6$ into a mixed number.

■ 4. Write $-114/25$ as a mixed number.

■ 5. Convert the mixed number into an improper fraction.

$$-2\frac{1}{6}$$

■ 6. Convert the mixed number into an improper fraction.

$$8\frac{4}{9}$$



ADDING AND SUBTRACTING MIXED NUMBERS

- 1. Simplify the expression.

$$5\frac{2}{3} + 1\frac{1}{12}$$

- 2. Simplify the expression.

$$8\frac{7}{8} - 2\frac{1}{8}$$

- 3. Simplify the expression.

$$7\frac{4}{5} - 6\frac{1}{15}$$

- 4. Simplify the expression.

$$15\frac{1}{2} - 11\frac{1}{4}$$

- 5. Joey and Alex are both solving the following problem.

$$2\frac{1}{3} + 1\frac{3}{5}$$



Joey takes $2 + 1 = 3$ and then takes

$$\frac{1}{3} + \frac{3}{5} = \frac{14}{15}$$

Then he adds them together to get

$$3\frac{14}{15}$$

Alex decides to change both into improper fractions before adding. He gets

$$2\frac{1}{3} = \frac{7}{3} \text{ and } 1\frac{3}{5} = \frac{8}{5}$$

Then she finds common denominators and adds them together to get

$$\frac{59}{15}$$

Who solved this problem correctly?

■ 6. Simplify the expression.

$$3\frac{2}{5} + \frac{3}{10} - 2\frac{3}{5}$$



MULTIPLYING AND DIVIDING MIXED NUMBERS

■ 1. When we multiply and divide mixed numbers, we need to change the mixed numbers into _____ fractions before we do the multiplication or division.

■ 2. Simplify the expression.

$$3\frac{3}{7} \cdot 1\frac{1}{7}$$

■ 3. Simplify the expression.

$$5\frac{1}{5} \cdot 2\frac{2}{3}$$

■ 4. Simplify the expression.

$$2\frac{3}{4} \div 5\frac{1}{8}$$

■ 5. Simplify the expression.

$$4\frac{5}{9} \div 2\frac{1}{4}$$



■ 6. Simplify the expression.

$$1\frac{4}{5} \div 3\frac{3}{8}$$



RELATIONSHIPS OF NUMBERS

- 1. Which fraction is larger?

$$\frac{1}{8} \text{ or } \frac{1}{6}$$

- 2. Which fraction is smaller?

$$\frac{3}{7} \text{ or } \frac{3}{8}$$

- 3. Find a number that's $\frac{1}{5}$ of the way from $\frac{3}{10}$ to $\frac{2}{5}$.

- 4. Find a number that's $\frac{2}{3}$ of the way from $-\frac{2}{3}$ to $\frac{1}{4}$.

- 5. Find the fraction halfway between $\frac{1}{2}$ and $\frac{2}{5}$.

- 6. Find the fraction halfway between $\frac{1}{10}$ and $\frac{8}{13}$.



ADDING MIXED MEASURES

- 1. Add the mixed measures.

4 seconds, 11 minutes, 3 hours, 35 minutes, 56 minutes, 35 seconds

- 2. Add the mixed measures.

34 inches, 2 yards, 5 feet, 8 inches, 13 feet, 1 yard

- 3. Add the mixed measures.

25 seconds, 1 hour, 15 minutes, 45 seconds, 22 minutes

- 4. Add the mixed measures.

13 inches, 45 feet, 35 inches, 27 feet, 9 yards

- 5. Add the mixed measures.

1 foot, 38 inches

- 6. Add the mixed measures.



1 hour, 85 minutes, 55 seconds, 20 minutes



PLACE VALUE

- 1. Identify the place value of the 2 in 4,562.387.

- 2. Identify the place value of the 0 in 307.119.

- 3. What is the number in the ten-thousandths place of 6,520.0019?

- 4. What is the number in the tenths place of 0.89104?

- 5. The further we move to the right of the decimal point, the _____
(smaller or larger?) the value gets.

- 6. The further we move to the left of the decimal point, the _____
(smaller or larger?) the value gets.



DECIMAL ARITHMETIC

- 1. Find the sum.

$$4.5 + 3.75$$

- 2. Find the difference.

$$7.87 - 4.9876$$

- 3. Find the product.

$$1.5 \cdot 8.8$$

- 4. Find the quotient.

$$5.65 \div 0.02$$

- 5. Simplify the expression.

$$2.5783 + 5.789 - 3.25$$

- 6. Simplify the expression.



$$1.24 \cdot 2.61$$



REPEATING DECIMALS

- 1. A finite decimal number is a number that _____.
- 2. Rewrite 0.888888 as a repeating decimal.
- 3. Rewrite 0.1818181818 as a repeating decimal.
- 4. What is the next digit in $3.\overline{142857}$?
- 5. What is the next digit in $0.41\overline{6}$?
- 6. Name an example of a decimal number that does not end, but does not repeat.



ROUNDING

- 1. If a number is _____ or greater, we round up.
- 2. Round 11.451 to the nearest tenth.
- 3. Round 691.014 to the tens place.
- 4. Round $11.\overline{6}$ to the nearest thousandth.
- 5. When we round a number to the tenths place, we look at the digit in the _____ place in order to determine which way to round the number.
- 6. Judith types $2 \div 3$ into the calculator and gets the answer 0.6666666667. Judith tells her friend Andy that this is not a repeating decimal because there is a 7 at the end. Andy disagrees and says the calculator rounds the number and that is why there is a 7. Who is correct? Why?



RATIO AND PROPORTION

- 1. Solve for the variable.

$$\frac{6}{10} = \frac{m}{15}$$

- 2. Solve for the variable.

$$\frac{d}{7} = \frac{14}{49}$$

- 3. Solve for the variable.

$$\frac{5}{v} = \frac{25}{40}$$

- 4. Solve for the variable.

$$\frac{22}{30} = \frac{33}{t}$$

- 5. Solve for the variable.

$$\frac{8}{12} = \frac{20}{x}$$



■ 6. The reason we multiply the left and right side by the same number when we cross multiply is because, when we're solving equations, we must keep both sides _____.



UNIT PRICE

- 1. If we can purchase 2 oranges for \$0.20, how many oranges can we purchase for \$2.00?

- 2. If we purchase 2 oranges for \$0.20, how much will it cost to purchase 5 oranges?

- 3. Sally went to the candy store and bought 40 jelly beans for \$0.50. How much would 60 jelly beans cost her?

- 4. While Steven is at the grocery store, he's trying to determine which bag of popcorn is the better deal. The first bag is a 10-ounce bag of popcorn for \$1.59. The second bag is a 15-ounce bag of popcorn for \$1.89. Which bag is the better deal? Why?

- 5. We can purchase 15 pencils for \$4. If we want to find the price per pencil, we would divide _____ by _____.



■ 6. We can purchase 15 pencils for \$4. If we want to find the number of pencils we can buy per dollar, we would divide _____ by _____.



UNIT MULTIPLIERS

- 1. When we're setting up a unit multiplier, the units we want to keep need to be placed in the _____ of the fraction.
- 2. Convert 8 yards to inches.
- 3. Convert 4 square feet to square inches.
- 4. Convert 144 square inches to square feet.
- 5. Convert 4,320 cubic inches to cubic feet.
- 6. Jason is converting 4,536 cubic feet to cubic yards. His work is shown below. Did he solve the problem correctly? Why or why not?

$$4,536 \text{ cubic feet} \cdot \frac{3 \text{ feet}}{1 \text{ yard}} \cdot \frac{3 \text{ feet}}{1 \text{ yard}} \cdot \frac{3 \text{ feet}}{1 \text{ yard}} = 122,472 \text{ cubic yards}$$



EXPONENTS

- 1. An exponent tells us how many times to multiply the base by _____.

- 2. Is 2^3 the same as 3^2 ? Why or why not?

- 3. Find the sum.

$$5^3 + 2^4$$

- 4. Write the number using exponents.

$$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$$

- 5. Write the following number without an exponent.

$$1^6$$

- 6. Write the number without an exponent.

$$(-9)^6$$



RULES OF EXPONENTS

- 1. Find the sum.

$$2x^3 + x^3 + x^3 + 3x^3$$

- 2. Find the product.

$$x^6 \cdot x^2 \cdot x^3$$

- 3. Simplify the expression.

$$x \cdot x \cdot x$$

- 4. Stephanie and Jimmy are trying to find a shortcut to simplify the expression below. Stephanie says that they should add the exponents ($3 + 5 = 8$) and then raise 4 to that power. Jimmy says that since it's multiplication, they should multiply the exponents ($3 \cdot 5 = 15$) and then raise 4 to that power. Who is correct and why?

$$4^3 \cdot 4^5$$

- 5. Simplify the expression.



$$\frac{x^5 + x^2 \cdot x^3}{x^7}$$

■ 6. Simplify the expression.

$$\frac{x^{-4} \cdot x^6}{x^2}$$



POWER RULE FOR EXPONENTS

- 1. The power rule tells us that, when we raise a power to a power, we can _____ those powers together.

- 2. Simplify the expression.

$$(x^3)^3$$

- 3. Simplify the expression.

$$(x^2)^{-4}$$

- 4. Simplify the expression.

$$(2^m)^p$$

- 5. Simplify the expression.

$$(x^2y^2)^3$$

- 6. Simplify the expression.



$$(x^{-5} \cdot x^4)^{-2}$$



NEGATIVE AND OTHER EXPONENT RULES

- 1. Simplify the expression.

$$\frac{9a^5b^4}{3a^2b^7}$$

- 2. Simplify the expression.

$$\frac{2x^0y^6 - (y^2)^3}{x^6}$$

- 3. Simplify the expression.

$$\frac{(x^{2p})^3}{x^{3p}y^{3p}}$$

- 4. Simplify the expression.

$$\frac{(x^{-3a+4})^2}{x^{-4a+8}y^{-2a}}$$

- 5. Simplify the expression.



$$\left(\frac{5x^{-2}}{y^{-2}}\right)^4$$

■ 6. Simplify the expression.

$$\left(\frac{2x^5y^7}{y^{12}}\right)^0$$



RADICALS

■ 1. Radicals are the opposite of _____.

■ 2. $\sqrt[4]{x}$ can also be written as _____.

■ 3. Find the value of $\sqrt{36}$.

■ 4. $x^{\frac{1}{3}}$ can also be written as _____.

■ 5. Find the value of $\sqrt{300}$.

■ 6. Find the value of $\sqrt{5,000}$.



ADDING AND SUBTRACTING RADICALS

■ 1. Find the value of $2\sqrt{3} + 5\sqrt{3}$.

■ 2. Find the value of $\sqrt{32} - \sqrt{2}$.

■ 3. Find the value of $\sqrt{3} + \sqrt{12}$.

■ 4. Find the value of $\sqrt{16} + \sqrt{25}$.

■ 5. Find the value of $4\sqrt{3} + 2\sqrt{2} - 2\sqrt{3} - \sqrt{2}$.

■ 6. Find the value of $3\sqrt{4} - 2\sqrt{9}$.



MULTIPLYING RADICALS

■ 1. Find the value of $\sqrt{20} \cdot \sqrt{4}$.

■ 2. Find the value of $\sqrt{13} \cdot \sqrt{7}$.

■ 3. Find the value of $8\sqrt{3} \cdot \sqrt{12}$.

■ 4. Find the value of $15\sqrt{2} \cdot \sqrt{16}$.

■ 5. Find the value of $2\sqrt{3} \cdot 5\sqrt{5}$.

■ 6. Find the value of $\sqrt[3]{12} \cdot \sqrt[3]{4}$.



DIVIDING RADICALS

- 1. Simplify the expression.

$$\sqrt{\frac{36}{6}}$$

- 2. Simplify the expression.

$$\sqrt{\frac{45}{5}}$$

- 3. Simplify the expression.

$$\frac{\sqrt{20x^5y^7}}{\sqrt{5x^3y}}$$

- 4. Simplify the expression.

$$\frac{\sqrt[3]{-32}}{\sqrt[3]{2}}$$



- 5. Simplify the expression.

$$\frac{\sqrt{5}}{\sqrt{15}}$$

- 6. Simplify the expression.

$$\frac{\sqrt{8}}{5\sqrt{2}}$$



RADICAL EXPRESSIONS

- 1. Find the value of $\sqrt{80} - \sqrt{20}$.
- 2. Find the value of $5\sqrt{24} \cdot \sqrt{15}$.
- 3. The square root of a number multiplied by the square root of the same number is equal to _____.
- 4. Find the value of $\sqrt{2} + \sqrt{32} - \sqrt{50}$.
- 5. To be able to add or subtract radicals, the roots must be _____ when they are simplified.
- 6. Roberta is trying to simplify the following radical expression,
$$\sqrt{4} + \sqrt{20} - 2\sqrt{5} + \sqrt{25}$$
and her work is shown below.

Step 1: $2 + \sqrt{20} - 2\sqrt{5} + 5$



Step 2: $2 + \sqrt{4 \cdot 5} - 2\sqrt{5} + 5$

Step 3: $2 + 4\sqrt{5} - 2\sqrt{5} + 5$

Step 4: $7 + 2\sqrt{5}$

In which step did she make a mistake? What should she have done differently, and what is the correct answer?



POWERS OF 10

■ 1. If we multiply a number by a power of 10, we can count the number of zeroes to know how many spaces to move the _____ to the _____.

■ 2. Find the product.

$$450 \cdot 10^0$$

■ 3. Find the quotient.

$$6.4 \div 100$$

■ 4. Find the product.

$$3.5 \times 10^4$$

■ 5. Find the product.

$$1.8 \times 10^{-2}$$



■ 6. Find the quotient.

$$420 \div 10^3$$



SCIENTIFIC NOTATION

■ 1. Scientific notation has 2 parts. The first part is the decimal number and the second part is the _____.

■ 2. The decimal number of a number written in scientific notation must be greater than or equal to 1 and less than _____.

■ 3. Write the number in scientific notation.

0.000000056

■ 4. Write the number in scientific notation.

0.00000000000012

■ 5. Write number in expanded form.

7.2×10^{12}

■ 6. Write number in expanded form.



$$4.9 \times 10^{-7}$$



MULTIPLYING SCIENTIFIC NOTATION

- 1. Write the product $(3.1 \times 10^5)(5.5 \times 10^{-7})$ in scientific notation.
- 2. Write the product $(1.8 \times 10^4)(5.9 \times 10^6)$ in scientific notation.
- 3. Write the product $(8.8 \times 10^{-2})(7.85 \times 10^{-5})$ in scientific notation.
- 4. Write the product $(1.3 \times 10^3)(2.6 \times 10^{-4})$ in scientific notation.
- 5. If we're given 3.6×10^{-2} in scientific notation, will we get a smaller or larger number when we multiply it by a positive power of 10?
- 6. Yvonne is asked to find the product of two numbers written in scientific notation:

$$(2.8 \times 10^4)(4.46 \times 10^{-6})$$

She solves the problem in three steps.

Step 1 $2.8 \times 4.46 = 12.488$



Step 2 $4 + (-6) = -2$

Step 3 12.488×10^{-2}

In what step did she make her mistake? What is the correct answer?



DIVIDING SCIENTIFIC NOTATION

- 1. When we divide two numbers that have the same base, we _____ the exponents.
- 2. Find the value of $(1.5 \times 10^8) \div (2.0 \times 10^{-3})$.
- 3. Find the value of $(6.75 \times 10^3) \div (1.5 \times 10^9)$.
- 4. Find the value of $(2.75 \times 10^{10}) \div (8.0 \times 10^8)$.
- 5. Find the value of $(7.5 \times 10^4) \div (1.5 \times 10^{-4})$.
- 6. If we're given 5.75×10^6 in scientific notation and we divide it by a negative power of 10, will we get a larger or smaller result?



MULTIPLYING AND DIVIDING SCIENTIFIC NOTATION

- 1. Simplify the expression.

$$\frac{(4.5 \times 10^3)(1.4 \times 10^{-5})}{2.8 \times 10^{-1}}$$

- 2. Simplify the expression.

$$\frac{(7.6 \times 10^5)(1.1 \times 10^{-7})}{5.1 \times 10^{-3}}$$

- 3. Simplify the expression.

$$\frac{(1.7 \times 10^{-3})(3.4 \times 10^{-4})}{(6.3 \times 10^{-3})(7.3 \times 10^{-2})}$$

- 4. Simplify the expression.

$$\frac{(4.9 \times 10^4)(6.4 \times 10^{-4})}{(8.2 \times 10^{-3})(2 \times 10^3)}$$

- 5. Simplify the expression.



$$\frac{(6.1 \times 10^6)(6.8 \times 10^{-4})}{(1.1 \times 10^{-5})(1.8 \times 10^5)}$$

■ 6. Danny and Deacon are working on finding the quotient below. Danny decides to multiply out the numerator and gets 10,000 for the powers of 10 portion. Then he divides it by 0.00061 to get 16,393,442.6 or 1.63934426×10^7 . Deacon decides he wants to divide, so he divides each number by 0.00061 and gets 819,672,131 and 32.78689852. Then he multiplies those numbers to get 2.68745×10^{10} . Why are the answers different? Who is correct?

$$\frac{(5 \times 10^5)(2 \times 10^{-2})}{6.1 \times 10^{-4}}$$



ESTIMATING SCIENTIFIC NOTATION

■ 1. Estimate the value of 3.65×10^{-5} .

■ 2. Use scientific notation to estimate the value $(5.75 \times 10^6)(2.34 \times 10^{-1})$.

■ 3. Use scientific notation to estimate the value of $(2.456 \times 10^3)(1.67 \times 10^{-7})$.

■ 4. Use scientific notation to estimate the value of the expression.

$$\frac{7.152 \times 10^2}{2.91 \times 10^2}$$

■ 5. Use scientific notation to estimate the value of the expression.

$$\frac{(6.2 \times 10^6)(6.4 \times 10^{-3})}{(4.25 \times 10^{-2})(2.9 \times 10^{-3})}$$

■ 6. Use scientific notation to estimate the value of the expression.

$$\frac{(1.7 \times 10^{-5})(2.6 \times 10^2)}{(3.334 \times 10^{-3})(2.5 \times 10^{-1})}$$



