

OL REVIEW on Exponents, Prime Factorization, Order of Operations, Math Properties, Variables and Expressions

1. How would you write "the quotient of 8 and m" as an algebraic expression?

$\frac{8}{m}$ or $8 \div m$

2. List three verbal expressions for each of the following operations:

Addition-total, sum, in all, altogether

Subtraction-difference, minus, less than, take away

Multiplication-product, per, times,

Division-quotient, split evenly, shared, divided

3. Generate an equivalent expression using the order of operations. (You should get the same answer for both problems.)

$$15 + [20 - (24 \div 8)^2 + 4]$$

$$15 + [20 - 3^2 + 4]$$

$$15 + [20 - 9 + 4]$$

$$15 + [11 + 4]$$

$$\frac{15 + 15}{30}$$

$$[7(2+4) \div 2] + 3^2$$

$$[1(6) \div 2] + 3^2$$

$$[42 \div 2] + 3^2$$

$$21 + 3^2$$

$$\frac{21 + 9}{30}$$

4. Nathan reads p pages each day of a 400-page book. Write an algebraic expression to show many days it will take Nathan to read the book?

$400 \div p$ -OR- $\frac{400}{p}$

5. Write the following in exponential ^(exponent) and standard form. ^(answer)

$$4 \times 4 \times 4 \times 4 \times 4 = 4^5 = 1024$$

$$4 \cdot 4 = 16 \cdot 4 = 64 \cdot 4 = 256 \cdot 4 = 1024$$

$$6 \cdot 6 \cdot 6 = 6^3 = 216$$

$$6 \cdot 6 = 36 \cdot 6 = 216$$

$$2 \cdot 2 \cdot 2 \cdot 2 = 2^4 = 16$$

$$2 \cdot 2 = 4 \cdot 2 = 8 \cdot 2 = 16$$

6. Solve the following:

$$\frac{3^3 + 2^4 + 4^2}{27 + 16 + 16}$$

$$\frac{43 + 16}{59}$$

3 · 3 = 9 · 3 = 27
2 · 2 = 4 · 2 = 8 · 2 = 16
4 · 4 = 16

7. Write each phrase as an expression.

stripled ^x less than 4 $4 - 3s$

the [÷] quotient of t and 5 $\frac{t}{5}$ or $t \div 5$

The ⁺ sum of 12 and m $12 + m$

20 ⁻ subtracted from n $n - 20$

five ^x squared ⁺ added to 7 $5^2 + 7$
or $7 + 5^2$

8. Determine whether the two expressions are equivalent. If so, tell what property is applied.

Associative, Distributive, Commutative, Identity, or Inverse

$$3 \cdot 1 = 3$$

yes; identity

$$(2 \cdot 5) \cdot 7 = 2 \cdot (5 \cdot 7)$$

yes; associative

$$5(x + 3) = 5x + 15$$

yes; distributive

$$14 - (7 - 2) = (14 - 7) - 2$$

no

$$12 + 15 = 15 + 12$$

yes; commutative

9. Evaluate each of the following expressions given:

$$a = -7 \quad b = 2 \quad \text{and} \quad c = 4$$

$$b + a = \underline{-5}$$

$$2 + (-7)$$

$$8c - a = \underline{39}$$

$$8 \cdot 4 - (-7)$$

$$32 - (-7) =$$

$$32 + 7$$

$$6b^2 = \underline{24}$$

$$6 \cdot 2^2$$

$$6 \cdot 4$$

$$32c \div 4b = \underline{16}$$

$$32 \cdot 4 \div 4 \cdot 2$$

$$128 \div 8$$

$$b^3 \div c = \underline{32}$$

$$2^3 \div 1$$

$$2^3 \div 4 = 8 \div 4$$

$$12c + 4a - 2b = \underline{16}$$

$$12 \cdot 4 + 4(-7) - 2 \cdot 2$$

$$48 + (-28) - 4$$

$$20 - 4$$

10. Using the **distributive property**, write an equivalent expression.

$$6(n + 9) = \underline{6n + 54}$$

$$3(2m - 1) = \underline{6m - 3}$$

$$(3p + 2) \cdot 5 = \underline{15p + 10}$$

$$6(2g - 3) = \underline{12g - 18}$$

$$(7x + 2y) \cdot 4 = \underline{28x + 8y}$$

$$-2(4r + 3h) = \underline{-8r - 6h}$$

$$7(2w + 3) = \underline{14w + 21}$$

11. Elaina made 3 baskets on Tuesday and 3 baskets on Saturday. Sophia made 5 baskets on Tuesday and 5 baskets on Saturday. Which expression is equivalent to the pictorial model?

Tuesday

3 baskets

5 baskets

Saturday

3 baskets

5 baskets

A $3 + 3 + 5 + 5$

B $3 \cdot 5$

C $2 \cdot 3 + 5$

D $(2 \cdot 3) + 5$

12. Which expression is NOT equivalent to $3 \cdot 7^2 \cdot 11$?

F $3 \cdot 7 \cdot 7 \cdot 11$ ✓

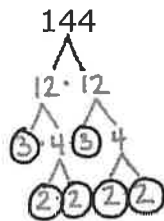
G $11 \cdot 7 \cdot 3 \cdot 7$ ✓

H $3 \cdot 7 \cdot 2 \cdot 11$ ✗

J $3 \cdot 11 \cdot 7^2$ ✓

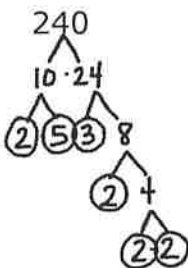
$3 \cdot 7^2 \cdot 11$
-or-
 $3 \cdot 7 \cdot 7 \cdot 11$

13. Write the prime factorization using exponents for the following numbers.



$2 \cdot 2 \cdot 2 \cdot 2 \cdot 3 \cdot 3$

$144 = 2^4 \cdot 3^2$



$2 \cdot 2 \cdot 2 \cdot 2 \cdot 3 \cdot 5$

$240 = 2^4 \cdot 3 \cdot 5$

14. Simplify each expression by combining like terms.

$6x + 2(x - 4) + 10 = 8x + 2$

$6x + 2x - 8 + 10$

$4x - 2y + 3(x - y) = 7x - 5y$

$4x - 2y + 3x - 3y$

$5(3x + 2y) - 7x + 4y = 8x + 14y$

$15x + 10y - 7x + 4y$

$8x + 3y - 5x + 2y = 3x + 5y$

15. Generate an equivalent expression using the stated property.

numbers change order
Commutative property of addition

$5 + (2 + 9) = (2 + 9) + 5$

groups change not numbers
Associative property of addition

$a + (b + c) = (a + b) + c$

opposites
Inverse property of addition

$4 + (-4) = 0$

number change order
Commutative property of multiplication

$9 \cdot 6 = 6 \cdot 9$

mirror
Identity property of multiplication

$5 \cdot 1 = 5$