

**CC6 Study Guide #1: Properties and Expressions**

Properties of Real Numbers	
Commutative - Order - changing the order does not change the sum/product	Associative - Grouping - changing the grouping of numbers does not change the sum/product
Identity of + and x - ADD ZERO or MULTIPLY by One to keep their identity	Inverse of + and x - ADD the OPPOSITE to get ZERO or MULTIPLY by the RECIPROCAL to get ONE.
Zero Product - any number multiplied by zero is equal to zero	Distributive - the number outside the parentheses is distributed to every number inside the parentheses.

1) Name the property that is shown by each statement.

A) $ab = ba$ <i>Commutative</i>	B) $(12 \cdot a) \cdot 0 = 0$ <i>Zero Product</i>
C) $(4 \cdot 15) - (4 \cdot 6) = 4(15 - 6)$ <i>distributive</i>	D) $4 + (2 + 7) = (4 + 2) + 7$ <i>associative</i>
E) $abc \cdot 1 = abc$ <i>Identity</i>	F) $-15 + 15 = 0$ <i>inverse</i>

2) Identify the parts of the expressions in:  $4a - 2b + c + 5$

Coefficients	Variables	Terms	Constants
<i>4, 2, 1</i>	<i>a, b, c</i>	<i>4a, 2b, c, 5</i>	<i>5</i>

3) Translate the following words into algebraic expressions.

A) 287 increased by 932 <i><math>287 + 932</math></i>	B) 7 subtracted from a number <i><math>x - 7</math></i>
C) a number n divided by 14 <i><math>n \div 14</math></i>	D) 9 less than a number z <i><math>z - 9</math></i>
E) 3 more than the quotient of a number x and 6. <i><math>x \div 6 + 3</math></i>	F) 6 times the quantity of a number m minus 5. <i><math>6(m - 5)</math></i>

Evaluate each algebraic expression using:  $x = \frac{1}{3}$        $y = 2\frac{1}{4}$        $z = 2$

4) $z - x^2$ <i><math>2 - \frac{1}{3}^2 \left(\frac{1}{3} \cdot \frac{1}{3}\right)</math></i> <i><math>2 - \frac{1}{9}</math></i> <i><math>1\frac{8}{9}</math></i>	5) $xyz$ <i><math>\frac{1}{3} \cdot 2\frac{1}{4} \cdot 2</math></i> <i><math>\frac{1\cancel{4}}{3} \cdot \frac{9\cancel{2}}{4} = \frac{3}{2} = 1\frac{1}{2}</math></i>	6) $x(y - z)$ <i><math>\frac{1}{3} \left(2\frac{1}{4} - 2\right)</math></i> <i><math>\frac{1}{3} \cdot \frac{1}{4}</math></i> <i><math>\frac{1}{12}</math></i>
---	--	---

**SIMPLIFY.** (HINT: Use the distributive property before combining.) Show all WORK.  
**MAKE SURE IT'S IN THE CORRECT ORDER. BE PRECISE!!**

<p>7) <math>m(m-8)</math>  <math>m^2 - 8m</math></p>	<p>8) <math>20 + (j+4)8 - 5j + 7</math>  <math>20 + 8j + 32 + 5j + 7</math>  <math>3j + 59</math></p>	<p>9) <math>10g - g + 8 + 4 + 23g - 5</math>  <math>32g + 7</math></p>
<p>10) <math>2(c+4d) + c - 8d</math>  <math>2c + 8d + c - 8d</math>  <math>3c</math></p>	<p>11) <math>8(h-20)</math>  <math>8h - 160</math></p>	<p>12) <math>5(3w+6) + 7w</math>  <math>15w + 30 + 7w</math>  <math>22w + 30</math></p>
<p>13) <math>7h + 1 - h + 4 + 2 - 5h</math>  <math>h + 7</math></p>	<p>14) <math>11(m-2n+5k)</math>  <math>11m - 22n + 55k</math></p>	<p>14) <math>7(5-4k) + 3(3m+7) + 6m</math>  <math>35 - 28k + 9m + 21 + 6m</math>  <math>15m - 28k + 56</math></p>

**Are the following expressions equivalent? EXPLAIN.**

<p>15) <math>5(a+6) = 30a</math>  <math>5a + 30 = 30a</math>          NO</p>	<p>16) <math>xy = yx</math>          yes because you can multiply in any order &amp; get the same answer</p>	<p>17) <math>k-j = j-k</math>          No, order matters in subtraction</p>
--	--	---

Write an expression, then solve. MAKE SURE TO DEFINE YOUR VARIABLE IF NECESSARY!!!

21) You go to the supermarket. You get six bags of apples and 6 cans of soda. Write an expression to represent the cost.

Variables:  $6a + 6s$

$a = \text{cost of apples}$   
 $s = \text{cost of soda}$

Expression:  $6a + 6s$

If one bag of apples costs \$4.00 and one can of soda is 1.50, how much do you pay the cashier?

$$\frac{6(4) + 6(1.50)}{24 + 9 = \$33}$$

22) Helen bought 3 shirts and 4 pairs of pants. Write an algebraic expression that represents the total cost of the shirts and pants, not including tax.

Variables:  $s = \text{cost of shirt}$

$p = \text{cost of pants}$

Expression:  $3s + 4p$

If one shirt costs \$15.00 and one pair of pants costs \$20.00, how much will Helen spend?

$$\frac{3(15) + 4(20)}{45 + 80 = \$125}$$

23) Your friend has six more than twice as many Frankie's game tokens as you. Write an expression for the number of Frankie's game tokens your friend has.

Variable:  $t = \text{tokens}$

Expression:  $2t + 6$

If you have 9 game tokens, how many tokens do you guys have altogether?

$$\frac{2(9) + 6}{18 + 6 = 24} \quad \underline{24 + 9 = 33}$$

24) Sarah and her friends want to go to the opening night of an upcoming movie. In order to avoid the long lines at the ticket counter, Sarah agreed to order all the tickets online. There are two main websites that sell tickets.

Fandango.com: Tickets are \$8 each with a \$ 1 handling fee per ticket

Ticketmaster.com: Tickets are \$10 each with a handling fee of \$2 total (not per ticket)

a) Write an expression for the price to order "m" tickets on each website.

Fandango.com:  $9m$

Ticketmaster.com:  $10m + 2$

b) If Sarah needs to buy tickets for five of her friends and herself, which website would be the least expensive? How do you know?

Least expensive site: Fandango  
 $9(5) = 45$   
 $10(5) = 50 + 2 = 52$