Topic	Helpful Information	Example
Absolute Value	Absolute value = the distance a number is from 0 on a number line	The absolute value of 5 and -5 equals 5 because they are both 5 units from 0
Axiom-Additive axiom	If a > b, then a + c > b + c.	
Axiom-Positive multiplication axiom:	If c > 0, then a > b if, and only if, ac > bc.	
Axiom-Transitive axiom	If a > b and b > c, then a > c	
Binomials-Multiplying two binomials	Formula = **(a+b) (c+d) =ac + ad + bc + bd** Use the FOIL method **First** **Outside** **Inside** **Last**	**(b+2) (b +3)** **First** b*b = b^2 **Outside** b*3 = 3b **Inside** 2*b =2b **Last** 3*2 =6 Combine: b^2 + 5b +6
Combining like terms	In order to combine they must have like variables and exponents. 1. Place like terms together. 2.Combine each set 3. Put the answers to each combine set together	2a + 4b + 5a – 2b - 2c + 4c **Step 1.**2a + 5a +4b – 2b -2c + 4c **Step 2**. 2a + 5a= 7a 4b -2b =2b 4c -2c =2c **Step 3.** Combine 7a + 2b + 2c
Equations-Linear equations	Slope-intercept form y = mx +b Standard form ax + by =c	Y = 3x + 9 where m=3 and b=9 4x + y = 20, a=4 and b=1 and c = 20
Equations-Solving Equations	**Step 1** All variables can be moved to the left of the equal sign and the numbers can be on the right. Move integers by adding the opposite sign of the integer. **Step 2**. Divide both sides by the coefficient.	Step 1. 2b + 3 =7 -3 -3 Step 2 2b = 4 b =2

Equations-Solving literal equations	**Step 1** The desired variable should be on the left Place all other variables on the right of the equal sign by adding opposites **Step 2** Divide both sides by the value of any other variable on the left to "isolate" the desired variable.	Solve for a x = aw aw =x a =x/w
Equations-Writing Equations	Look for key words, for example "**the product of**" means you should place the constant before a variable "**less than**" and " **more than**" means you should flip the order Substitute equal when you see "**is**" If there are not any key words create an equation in the order that the words are written.	The product of 5 and x is 14 **5x = 14** y more than three is 15 **3 + y =15** Ten less than x is 5 **x - 10 = 5** The sum of 11 and y is 13 **11 + y =13**
Exponents **And Rules for Exponents**	Exponents tell you how many times to use the number in multiplication **The Rules** $x^m * x^n = x^{(m+n)}$ $(x^n)^m = x^{(nm)}$ $(xy)^m = x^m y^m$	**3^2** = 3*3 =9 **3^3** = 3*3*3= 27 **3^4** = 3*3*3*3 = 81 $2^2 * 2^3 = 2^{(2+3)} = 2^5$ $(2^3)^2 = 2^{(2*3)} = 2^6$ $(2*3)^3 = 2^3*3^3 = 8*27 = 216$
Exponents-Negative exponents	Move the term to the denominator, make the exponent positive then apply the power.	3^{-2} = 1/3*3 = 1/9 3^{-3} = 1/3*3*3= 1/27

Expression-Evaluating Expressions	Replace the variable with parentheses Inside the parentheses place the value Simplify and solve.	Step 1: 5(x) + 6 for x = 2 Step 2: 5(2) + 6 Step 3: 10 +6 =16
Expression-Writing Expressions	Look for **key words** of algebraic expressions. Combine these written expressions with variables for unknown values into an algebraic expression.	Six less than twice the value: 2x-6 Five less than a number: x-5
Find slope from two points	Make a function table using the x and y values of two points	Subtract $y_1 - y_2$ equals **Rise** Subtract $x_1 - x_2$ equals **Run** Write as: **Rise/Run**
Function	f(x) = x^2	
Greatest common factor	The greatest number that is the largest factor of two or more given numbers	GCF of 6 and 3 is 3 GCF of 6,12,36 is 6 GCF of 8, 12, 16 is 4

Integers -Adding Integers	If the signs are the same, then add and keep same sign. If signs are different subtract, keep sign of the largest number.	9 + 5 =14 (same sign) -9 + -5 = -14 (same sign) -9 + 5 = -4 (opposite signs) 9 + -5 = 4 (opposite signs)
Integers-Dividing Integers	Divide the integers and apply the sign rules. Same signs = positive answer Different signs = negative answer	8 ÷ 2 = 4 8 ÷ -2 = -4 -8 ÷ -2 = 4 -8 ÷ 2 = -4
Integers-Multiplying Integers	Multiply the integers and apply the sign rules. Same signs =positive product Different signs = negative product	8 * 4 = 32 (-5) * (-2) = 10 5 * (-2) = -10 (-8) * (4) = -32
Inequalities-Solving Inequalities	**Step 1** All variables should be on the left of the equal sign and the numbers should be on the right. Do this by adding opposites **Step 2.** Divide by the positive value of the variables coefficient **Step 3.** If the **coefficient to the variable is negative**, reverse the inequality and when dividing by -1 (or any negative).	**Step 1** -4b + 6 < -14 **Step 2** -6 -6 -4b < -20 **Step 3** -b < -5 b > 5

Integers-Subtracting Integers	To subtract an integer add it's opposite Apply these rules: 1. Two like signs become positive 2. Two unlike signs become negative	9 - (-4) 9 +(+4) = 13 Two like signs -9 –(+4) = -9 + -4= -13 Two unlike signs -9 –(-4) = -9 + (+4) = -5 Two like signs
Inequalities-Writing Inequalities	Use the same rules as writing equations The < is used instead of " is less than" The > is used instead of " is greater than"	The product of 6 and y is greater than 14 **6y > 14** Y more than 6 is less than 11 **6 + y < 11**
Missing factors	These can be set up as a multiplication problem or a division problem	
Monomials-Dividing by a monomials	Separate the expression into two fractions and then divide coefficient but subtract exponents.	$(6x^2 - 4x)/2x$ $(6x^2)/2x + (-4x)/2x$ $3x - 2$
Monomials-Dividing monomials	When dividing monomials you subtract the exponents of like variables	$(a^3 b^6)/(a^2 b^3)$ Divide a's and b's $a^3/a^2 = a^{(3-2)=}a$ $b^6/b^3 = b^{(6-3)}= b^3$ *Combine together* ab^3
Monomials-Multiplying monomials	When multiplying monomials, add exponents with the same variables	$(a^2 b^4 c^3)(a^3 b^4 c^3)$ $a^2 \times a^3 = a^{(2+3)} = a^5$ $b^4 \times b^4 = b^{(4+4)} = b^8$ $c^3 \times c^3 = c^{(3+3)} = c^6$ *combine after adding exponents* $a^5 * b^8 * c^6$
Monomials-Negative powers of a monomials	When dividing or multiplying monomials with negative powers use the rules of integers	$a^5 \times a^{(-3)} = a^{(5-3)} = a^2$ $b^4 \times b^{(-2)} = b^{(4-2)} = b^2$

	and add the signed numbers.	
Monomials-Raising monomials to a power	Multiply the exponent in the parentheses by the power.	$(a^2\ b^4\ c^3)^2$ $(a^2)^2=a^4$ $(b^4)^2=b^8$ $(c^3)^2=c^6$ *Combine after multiplying by the power* $a^4\ b^8 c^6$
Multiplying signed numbers **The Rules**	(+) • (+) = (+) (+) • (-) = (-) (-) • (+) = (-) (-) • (-) = (+)	
Order of Operations	PEMDAS Parentheses Exponents Multiply/Divide(left to right) Add Subtract (left to right)	
Plotting points on the coordinate plane	Step 1 Start at the origin. Find the x-axis, count right for positive and left for negative x value Step 2 Find the y-axis, count up for positive and down for negative y value. Step 3 Write the location of this point	**Plot (6 -4)** **Step 1** Begin at (0,0) move 6 to the right If it was negative you would move to the left **Step 2.** Move down since it is negative **Step 3** Plot the point
Polynomial multiplied by -1	When you multiply by -1 you simply change the sign of every term listed.	-1(4a + 3b - 3c) **= -4a -3b + 3a**

Polynomial multiplied by a monomial	Multiply each term by the monomial Combine terms	$2x(3x^2 + 2x -3)$ $2x(3x^2) = 6x^3$ $2x(2x) = 4x^2$ $2x(-3) = -6x$ Combine any like and list from largest exponent in order: $6x^3 + 4x^2 -6$
Polynomial multiplied by a variable	**Step 1** Multiply each term by the variable remember to add the exponents. **Step 2** Combine.	$x(3x^2 + 2x -3)$ $x(3^2) = 3x^3$ $x(2x) = 2x^2$ $x(-3) = -3x$ ***Combine*** $3x^3 + 2x^2 -3x$
Polynomial multiplied by an integer	**Step 1:** Multiply each term by the integer changing only the coefficients. **Step 2:** Combine terms	$2(3x^2 + 2x -3)$ $2(3x^2) = 6x^2$ $2(2x) = 4x$ $2(-3) = -6$ ***Combine*** 6x^2 + 4x -6
Polynomials-Adding Polynomials	**Step 1** Arrange in descending order of exponents **Step 2** Combine terms with like variables and exponents	Combine $-3x^8-6x^9-4x^9+8x+7x^8-2x$ **Step1** $6x^9-4x^9 + 3x^8 - 7x^8 + 8x - 2x$ **Step 2** $2x^9 + 4x^8 + 6x$
Polynomials-Degree of a polynomial	The highest exponent after being simplified	$2^4 – 5^3 – 10x + 7$ is a fourth degree polynomial $2^7 – 5^3 – 10^2 + 7$ is a seventh degree polynomial
Polynomials-Subtracting Polynomials	Set up the problem vertically in descending order Change the bottom signs and add	$15x^3 - 10x^2 + 3- (10x^3 + 30x^2 + 2)$ ..... $15x^3 - 10x^2 + 3$ $-(10x^3 + 30x^2 + 2)$ ..... $15x^3 - 10x^2 + 3$ $\mathbf{-10x^3 - 30x^2 - 2}$ _____ $\mathbf{5x^3 - 40x^2 + 1}$

Property-Associative property	a + (b + c) = (a + b) + c Changing groupings	Ex. 2 + (5 + 3) = (2 + 5) + 3
Property-Commutative property	a + b = b + a	Ex. 7 + 3 = 3 + 7
Property-Distributive property	Multiply the terms inside the parenthesis by the term on the outside of the parenthesis	c(a + b) = ca + cb 3(c - b) = 3c -3b
Quadratic Equation	$ax^2 + bx + c = 0$ a, b, and c are known values x =variable	$3x^2 + 4x + 3 = 0$

MooMooMath provides quick homework help, great instruction, tools and Math resources

http://www.moomoomath.com/