Term	Definition	Notation	Diagram/Visual
Ratio	A ratio shows the relative sizes of two or more values	If there is 1 boy and 3 girls	$1:3$ 1/4 are boys 3/4 are girls
Proportion	Proportion says that two ratios (or fractions) are equal.	$\frac{1}{3} = \frac{2}{6}$	
Scale	The ratio of the length in a drawing to the length on the real thing	$1:1:1$ $150 \rightarrow 1500$	Chair 150 lbs
Dimensional Analysis	Analysis using the fact that physical quantities added to or equated with each other must be expressed in terms of the same fundamental quantities for inferences to be made about relations between them	years $\rightarrow$ seconds mi/hr $\rightarrow$ m/s kg/m³ $\rightarrow$ g/mL in² $\rightarrow$ ft²	If 2 red = 1 blue 4 red is... $\frac{4 \text{ red}}{1}, \frac{1 \text{ blue}}{2 \text{ red}} = 2 \text{ blue}$
Expression	Numbers, symbols and operators grouped together that show the value of something.	$2+3$ is an expression no equal signs	$+$ $-$ $\div$ $\times$
Term	In algebra a term is either a single number or variable, or numbers and variable multiplied together	$7x \quad x \quad -2x$	xy^2
Coefficient	A number used to multiply a variable, variables with no number have a coefficient of 1.	62 means 6 times z $\rightarrow$ x is really 1x	
Factor	Numbers we can multiply together to get another number	$2 \times 3 = 6$ factor factor	1, 2, 3, 4, 6 and 12 are all factors of 12

Term	Definition	Example
monomial	A polynomial with just <u>one term</u>	Example = $3x^2$ <u>one term</u>
polynomial	A polynomial can have Constants, variables and exponents, that can be combined using addition, subtraction, multiplication and division.	$4xy^2 + 3x - 8$
Distributive property	Multiplying the sum of two or more addends by a number produces the same result as when each addend is multiplied individually by the number and the products are added together.	$(20 - 5)$ $180 - 45$
Closure Property	Any two rational numbers product will be a rational number	
square	A flat shape, with four edges with right angles $90°$	
Square root	A square root of a # is that a value that when multiplied by itself, gives the number	4 $4 \times 4 = 16$
Rational numbers	A rational number can be made by dividing an integer by an integer	$1.5 = \frac{3}{2}$ — ratio $\frac{1}{3} = .33333$
Irrational numbers	An Irrational number is a real number that cannot be written as a simple fraction	$\sqrt{5}$ π is a Irrational #
Product Property of Radicals	The square root of a product is equal to the product of the square roots of each of the factors	$\sqrt{ab} = \sqrt{a} \cdot \sqrt{b}$ $a, b \geq 0$
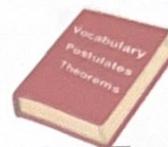
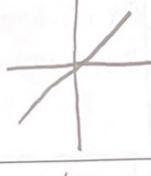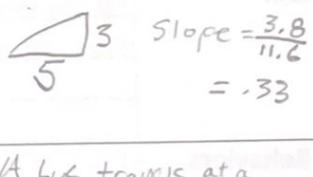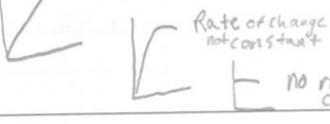| Quotient Property of Radicals | The square root of a quotient is equal to the quotient of the square roots of the dividend and divisor | $$\sqrt{\frac{A}{b}} = \frac{\sqrt{A}}{\sqrt{b}}$$ |

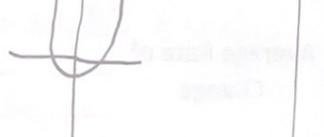| Term	Definition	Notation	Diagram/Visual
		will have "$=$"	$1+1=2$
Equation	A statement that the values of math expressions are equal	$7+2 = 10-1$	
Commutative Property	The order in which we multiply numbers does not change the product	$A+b = b+a$ $xy = yx$ Add = doesn't change = multiplication	$A+b = b+A$ $00+00+000 = 000+00+2$ $2 \quad 3 \qquad 3 \quad 2 \quad 00$
Associative Property	a math rule that says that the way in which factors are grouped in a multiplication problem does not change the product	$(A \times b) \times c = a \times (b \times c)$ $(a+b)+c = a+(b+c)$	$3x^2 + 5 = 3x + 15$
Distributive Property	multiplying the sum of two or more addends by a number produces the same result as when each addend is multiplied individually by the number and the product are added together	Multiplying outside number with the ones in the parenthesis	$4(8+3)$ $4 \cdot 8 = 32 \qquad 44$ $4 \cdot 3 = 12$ $\overline{}$ 44
Addition Property of Equality	If two expressions are equal to each other and you add the same value to both sides of the equation will remain equal.	Whatever is added to one side of the equal sign must be added to the other side	for any numbers $a, b,$ and c if $a = b$ then $a+c = b+c$
Subtraction Property of Equality	an equal value subtracted or removed from two equal items will result in a new equal amount	$A = b$ $a-c = b-c$ Whatever is subtracted from one side = other side too	$y+9 = 45$ $\underline{-9 \quad -9}$ $y = 39$
Multiplication Property of Equality	When we multiply both sides of an equation by the same number, the two sides remain equal	$A = b$ $a = (3)*b$ $3a = 3b$	If $x = y$ then $x \times z = y \times z$
Division Property of Equality	If both sides of an equation are divided by a common real number that is not equal to 0, the equations remain equal	each sides remain the same	If $x = y$ then $x \div z = y \div z$

nmetric roperty	If $A=b$, then $b=a$, states that the values on either side of the equals sign are equal	$A=b$ $b=a$ Can be interchange	
bstitution Property	One value can replace another value in an expression or equation and the value will remain the same	$2x + 7y =$	Substatuting is basically switching out
Inequality	An inequality compares two value, showing if one is less than, greater than, or simply not equal to another value.	$A \neq b$ $A < b$ $A \geq b$ $A > b$ $b \leq A$	great or less symbols
Solution Set	The set of all the solutions of an equation or condition	$y = 2x - 2$ $(0, -2), (3, 4), (-3, -8), (2, 2)$	A set that has the solution to come up with an already answer
Literal Equation	An equation which consist primarily of letters	Solve for p Solve for y	$p + z = x$ $xy = r$
Linear Function	those whose graph is a straightline		Strait lines which are measured
Slope	How steep a line is also called "gradient"	$3/5 = .6$	Slope $= \frac{3.8}{11.6}$ $= .33$
Average Rate of Change	A measure of how much the function changes per unit, on average, over that interval	$A(x) = \frac{f(b) - f(a)}{b - a}$	A bus travels at a speed of 80 km per hour
Constant Rate of Change	When the ratio of the output to the input stays the same at any given point on the function	Known as a slope	Constant rate of change Rate of change is not constant no rate of Change

Term	Definition	Example	Description
Ordered Pairs	Two numbers written in a certain order	$(12, 5)$	12 units along 5 units up
X-Intercept	The X-coordinate of a point where a line, curve, or surface intersects the X-axis	Intercept	The point where a line crosses the X axis
Y-Intercept	The point where the graph intersects the y-axis	Intercept	One line on the X, and y
Arithmetic Sequence	A list of numbers with a definite pattern	a_n = the nth term in the sequence a_1 = the first term in the sequence d = the common difference between terms	$5 \cdot 9 \cdot 13 \cdot 17$ +4 +4 +4 2 4 8 16 32 ×2 ×2 ×2 ×2
Continuous	A function such that a continuous variation (that is a change without jump) of the argument induces a continuous variation of the value of the function	No gaps, just continuous curve	
Discrete	The study of math, dealing with objects that can assume only distinct, separate values.	EX: 6.boys EX: •••5	Dots
Domain	All the values go to that function	Range / Domain / B	area at the bottom of a graph
End Behaviors	how the function behaves when the variable X X increases or decreases without bound		
Explicit Formula	It calculates the nth term in a sequence	$2,4,6,8,10,12 \rightarrow A_n = 2n$ $1,3,5,7,\ldots \rightarrow a_n = 2n-1$ $2,6,18,54,\ldots a_n = 2 \cdot 3^{n-1}$	It represents all the terms in a equation

Interval Notation	A method to represent an interval on a number line	included [number line] Not included	A real number line A to b from one point to another
Linear Model	An equation that describes a relationship between two quantities that show a constant rate of change	[graph distance vs time(sec)] argument variable	Strait line
Parameter	A value that is more "built in" to a function, it is similar to a variable, but stays fixed while we use the function	h(year) = 20 × year Function Parameter	[sun drawing]
Range	The difference between the lowest and highest values	[number line] 3 4 5 6 7 8 9 9-3=6	Range can also mean all the output values of a function
Recursive Formula	A function that repeats or uses its own previous term to calculate subsequent terms and thus forms a sequence of terms	$A_{n+1} = 3a_n + 2$ $a_1=1$ $A_2 = 3a_1 + 2 = 5$ $A_3 = 3a_2 + 2 = 17$ $a_4 = 3a_3 + 2 = 53$	Repeating formula
Substitution	Putting numbers where letters are	$x - 2$ $x = 6$ $6 - 2 = 4$	Replacing letters for #'s