

Order of Operations

P Parentheses
E Exponents
M Multiplication
D Division
A Addition
S Subtraction

Positive and Negative Numbers

- **+**

← Notice the < sign Notice the > sign →

this direction gets smaller this direction gets larger

Place Value

1,234,567,890.1234

billions hundred millions ten millions millions hundred thousands ten thousands thousands hundreds tens ones tenths hundredths thousandths ten thousandths

commas decimal point

Improper Fractions and Mixed Numbers

$$5\frac{3}{4} = \frac{23}{4}$$

Numerator = $5 \times 4 + 3$
 Denominator = 4

$$\frac{17}{3} = 5\frac{2}{3}$$

Divide 17 by 3 and get 5 for the whole number and 2 for the remainder

Percents are Just Special Fractions

$$27\% = \frac{27}{100}$$

$$33\frac{1}{3}\% = \frac{\frac{100}{3}}{100}$$

$$\frac{100}{3} \times \frac{1}{100} = \frac{1}{3}$$

Translate Percent Problems

12% of what number is 6

0.12 x N = 6

"of" means "multiply"
 "what number" is a variable
 "is" means "equal"

Perfect Squares

Square means "multiply a number by itself"

$1^2 = 1$ $6^2 = 36$
 $2^2 = 4$ $7^2 = 49$
 $3^2 = 9$ $8^2 = 64$
 $4^2 = 16$ $9^2 = 81$
 $5^2 = 25$ $10^2 = 100$

Conversions

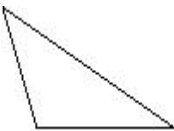
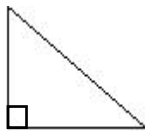
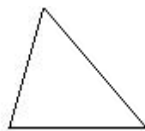
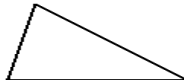
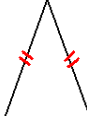
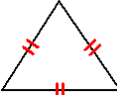
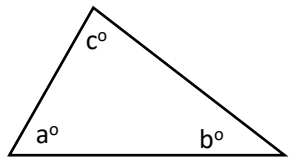
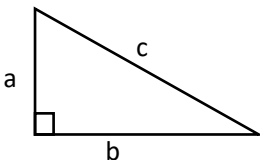
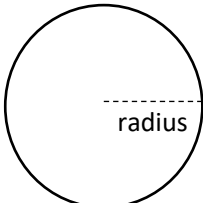
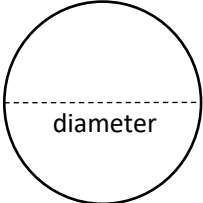



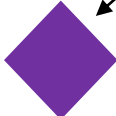


Divide numerator by denominator

Move decimal 2 to the right

Fraction	Decimal	Percent
$\frac{1}{4} = \frac{25}{100}$	0.25	25%
$\frac{4}{7}$	0.571	57.1%
$\frac{2}{3}$	$0.\overline{6}$	$66\frac{2}{3}\%$

Put number over place value and simplify

Move decimal 2 to the left

<h3>Distributive Property</h3> $5(3 + 2) =$ $5(3 + 2) =$ $15 + 10 = 25$ <hr/> $5(x + y)$ $5(x + y)$ $5x + 5y$	<h3>Measures of Central Tendency</h3> <div style="border: 1px solid black; padding: 5px; display: inline-block;"> 1,2,4,4,4 </div> <p>Mean = the average (3)</p> <p>Median = the one in the middle (after put in order) (4)</p> <p>Mode = the one that occurs mode often (4)</p> <p>Range = largest number minus the smallest number (3)</p>	<h3>Number Families</h3> <ul style="list-style-type: none"> Real Numbers <i>Rational and irrational #s</i> Rational Numbers <i>Integers + fractions, decimals and percents</i> Integers <i>(...-3,-2,-1,0,1,2,3...)</i> Whole Numbers <i>(0,1,2,3...)</i> Counting Numbers <i>(1,2,3...)</i> 	<h3>Classifying Triangles</h3> <p>By Angles</p> <div style="display: flex; justify-content: space-around; align-items: center;">  obtuse  right  acute </div> <p>By Side Length</p> <div style="display: flex; justify-content: space-around; align-items: center;">  scalene  isosceles  equilateral </div>
<h3>Triangles Properties</h3>  <p>The sum of the angles of all triangles equals 180°.</p> $a^\circ + b^\circ + c^\circ = 180^\circ$	<h3>Pythagorean Theorem</h3>  $a^2 + b^2 = c^2$ <p>Only for right triangles</p>	<h3>Circles</h3>   <p>Total degrees = 360°</p>	<h3>Classifying Quadrilaterals</h3> <div style="display: flex; justify-content: space-around; align-items: center;">  Trapezium  Trapezoid </div> <div style="border: 1px dashed black; padding: 10px; margin-top: 10px;">  <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  Rhombus </div> <div style="text-align: center;">  Rectangle </div> </div> <div style="text-align: center; margin-top: 10px;">  Square </div> </div>

<p>Exponents</p> $5^0 = 1$ <hr/> $5^2 = 25$ $5^{-2} = \frac{1}{25}$ <hr/> $(-5)^2 = 25$ $-(-5)^2 = -25$ <hr/> $\sqrt{25} = \pm 5$	<p>Rules for Exponents</p> <p>Product Rule (add exponents)</p> $x^2 \cdot x^3 = x^5$ $x^2 \cdot x^{-3} = x^{-1}$ <hr/> <p>Quotient Rule (subtract exponents)</p> $\frac{y^5}{y^2} = y^3$ $\frac{y^5}{y^{-2}} = y^7$ <hr/> <p>Powers Rule (multiply exponents)</p> $(z^2)^3 = z^6$ $(z^2)^{-3} = \frac{1}{z^6}$		<p>Algebraic Expressions</p> <p>Adding Like Terms</p> $2x^2y^3 + 4x^2y^3 = 6x^2y^3$ <hr/> <p>Multiplying Terms</p> $x^2x^3y^3y^4 = x^5y^7$ <hr/> <p>Dividing Terms</p> $\frac{x^8y^3}{x^3y^5} = \frac{x^5}{y^2}$	<p>Slope</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> $\frac{\Delta y}{\Delta x}$ </div> <p>ex. (4,3) and (6, -2)</p> $\frac{-2 - 3}{6 - 4} = \frac{-5}{2}$ <hr/> <p>Slope-Intercept Form</p> $y = mx + b$ <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px 5px;">slope</div> <div style="border: 1px solid black; padding: 2px 5px;">y-intercept</div> </div>
<p>Distance Formula</p> $D = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$	<p>One-Step Equations</p> $\begin{array}{rcl} x + 5 & = & 13 \\ -5 & = & -5 \\ \hline x & = & 8 \end{array}$	<p>Two-Step Equations</p> $\begin{array}{rcl} 2x + 5 & = & 13 \\ -5 & = & -5 \\ \hline 2x & = & 8 \\ \frac{2x}{2} & = & \frac{8}{2} \\ \hline x & = & 4 \end{array}$	<p>Rectangular Coordinates</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>How to graph a coordinate:</p> <ul style="list-style-type: none"> first, go right (+) or left (-) then, go up (+) or down (-) </div> 