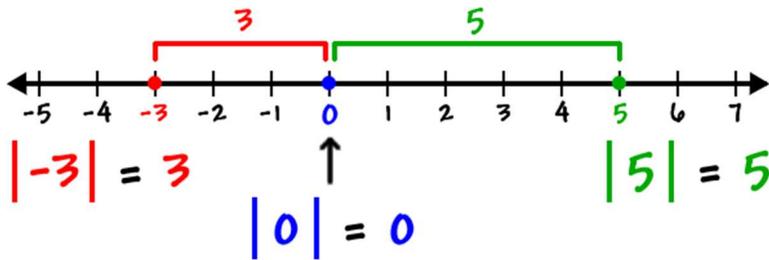


Absolute Value

How far a number is from zero or the distance from zero



Integers

Remember, Integers are numbers that are:

The Integers

$\{\dots, -3, -2, -1, 0, 1, 2, 3, \dots\}$

Includes:

- All negative whole numbers
- Zero
- All positive whole numbers

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<p>To subtract one integer from another, add the opposite of the second integer to the first integer.</p> <p>Then, follow the rules of addition.</p>	<p>Signs the same? Add the numbers and keep the sign.</p>
<p>Signs the same? Divide the numbers and the quotient is positive.</p>	<p>Signs different? Subtract the two numbers and keep the sign of the number with the greater absolute value.</p>
<p>Signs different? Divide the numbers and the quotient is negative.</p>	<p>Signs the same? Multiply the numbers and the product is positive.</p>
	<p>Signs different? Multiply the numbers and the product is negative.</p>

Decimals

Addition
The decimal point must be lined up!
Just like adding whole numbers, except with a decimal point.

$$\begin{array}{r} 6.80 \\ + 7.06 \\ \hline 13.86 \end{array}$$

imaginary zero

Subtraction
*some rules as addition

$$\begin{array}{r} 15.3 \\ - 5.01 \\ \hline 10.29 \end{array}$$

Decimals
A number that uses place value and a decimal point to show value less than 1.

H	T	O	.	T	H	H	T	H
	3			4	7			

Thirteen and forty-seven hundredths.
\$13.47

Multiplication
• Multiply just like whole numbers.
• The product will have the number of decimal places as the factors have combined.
• The decimal places do not need to be lined up!

$$\begin{array}{r} 6.35 \\ \times 3.7 \\ \hline 1270 \\ + 1905 \\ \hline 20320 \end{array}$$

→ 2 decimal places
→ 1 decimal place
↓
3 decimal places

Division
• move the decimal in the dividend and the divisor all the way to the right.
• Divide like normal!

$$49 \div 7 = 70$$

$$490 \div 7 = 70$$

$$22 \div .02 = 11$$

$$22 \div 2 = 11$$

(No zero)

Fractions

<p>Addition</p> <p>Determine a common denominator, and generate equivalent fractions using the common denominator.</p> <p>Add the numerators, and keep the denominator the same.</p> <p>For mixed numbers, if you add the fractions and get an improper fraction, you'll need to regroup to the whole number part of the sum.</p>	<p>Multiplication</p> <p>If you have mixed numbers, convert them to improper fractions.</p> <p>Multiply the numerators to determine the numerator of the product, and multiply the denominators to determine the denominator of the product.</p> <p>Simplify the product if necessary.</p>
<p>Fractions</p>	
<p>Subtraction</p> <p>Determine a common denominator, and generate equivalent fractions using the common denominator.</p> <p>Subtract the numerators, and keep the denominator the same.</p> <p>For mixed numbers, you may need to regroup from the whole number part of the minuend (first number) in order to subtract the fractions.</p>	<p>Division</p> <p>If you have mixed numbers, convert them to improper fractions. Take the reciprocal of the divisor.</p> <p>Multiply the numerators to determine the numerator of the dividend, and multiply the denominators to determine the denominator of the dividend.</p> <p>Simplify the dividend if necessary.</p>

Addition: $\frac{1}{2} + \frac{1}{4} = \frac{2}{4} + \frac{1}{4} = \frac{3}{4}$

Subtraction: $\frac{1}{2} - \frac{1}{4} = \frac{2}{4} - \frac{1}{4} = \frac{1}{4}$

Multiplication: $\frac{1}{2} \cdot \frac{1}{4} = \frac{1}{8}$

Division: $\frac{1}{2} \div \frac{1}{4} = \frac{1}{2} \cdot \frac{4}{1} = \frac{4}{2} = 2$

Properties of Integers

Property	Description	Example
Commutative Property of Addition	Changing the order does not change the sum	$2 + 5 = 5 + 2$
Commutative Property of Multiplication	Changing the order does not change the product	$-3 \cdot 8 = 8 \cdot (-3)$
Associative Property of Addition	Changing the grouping does not change the sum	$(1 + 2) + 3 = 1 + (2 + 3)$
Associative Property of Multiplication	Changing the grouping does not change the product	$(1 \cdot 3) \cdot 5 = 1 \cdot (3 \cdot 5)$
Distributive Property	Multiplying the term on the outside of the parenthesis to each term on the inside of the parenthesis	$2(-4 + x) = (-8) + 2x$ Or $2(4 - x) = 2 \cdot 8 + 2 \cdot x$
Inverse Property of Addition	The sum of any integer and its additive inverse is 0	$6 + (-6) = 0$

Distributive Property

$5(x + 2) = 5 \cdot x + 5 \cdot 2$
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$(5x)(3x + 6) = 5x \cdot 3x + 5x \cdot 6$

$(5)(3x^2 + 2x + 6) = 5 \cdot 3x^2 + 5 \cdot 2x + 5 \cdot 6$

Combining Like Terms

A typical question is : Simplify $2a + 3b + 3a$

$$2a + 3b + 3a$$

If we think of "a" being Apples and "b" being Bananas, then we have the following situation:



We can see that by combining the like objects, the above can be simplified to be 5 Apples and 3 Bananas, which in Algebra is:

$$5a + 3b \checkmark$$

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