

Lesson 1, Addition & Subtraction of Fractions

Lines & Segments

To add or subtract fractions with similar denominator, we simply add or subtract the numerators.

$$\frac{5}{11} + \frac{2}{11} = \frac{5+2}{11} = \frac{7}{11}$$

Unlike denominators must be rewritten:

$$\frac{1}{3} + \frac{2}{5} = \frac{5}{15} + \frac{6}{15} = \frac{11}{15}$$

A mixed number is a whole number & a fraction.
 $13\frac{3}{5}$

Adding or subtracting mixed numbers may require borrowing.

$$5\frac{4}{5} + 3\frac{3}{5} = 8\frac{7}{5} = 8 + 1\frac{2}{5} = 9\frac{2}{5}$$

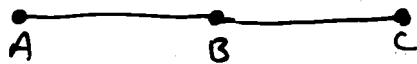
$$5\frac{1}{5} - 3\frac{2}{5} = 4 + \frac{5}{5} + \frac{1}{5} - 3\frac{2}{5} = 4\frac{6}{5} - 3\frac{2}{5} = 1\frac{4}{5}$$

Lines never end. Therefore we use arrows to represent neverending lines.

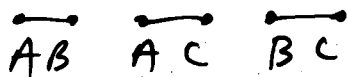


We use letters to name a line.

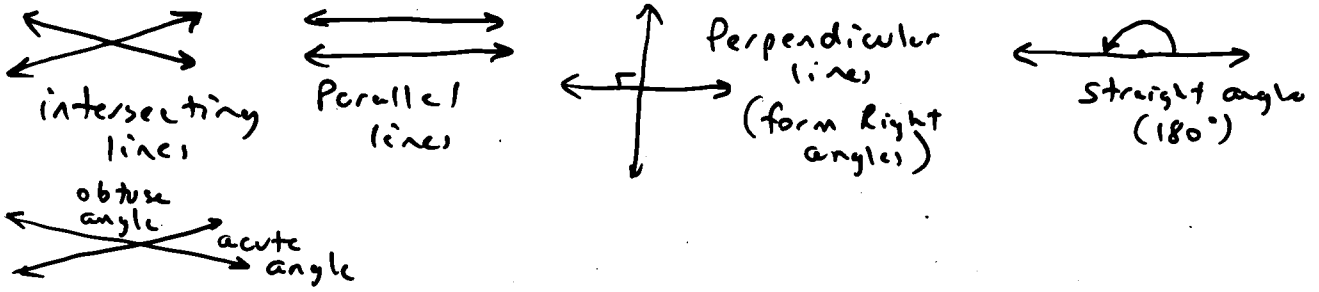
A segment has both a starting & an ending point



How many line segments can you see above?

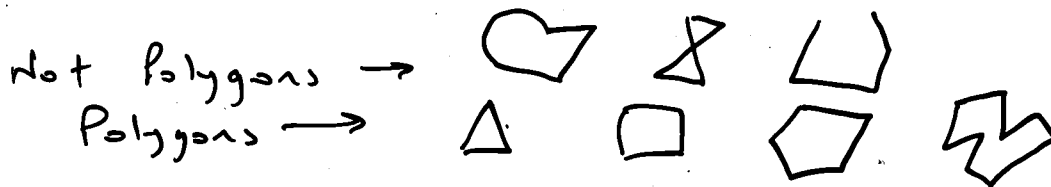


Lesson 2 Notes: Angles · Polygons · Triangles · Quadrilaterals

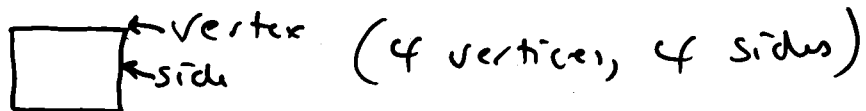


A circle has 4 90° angles. Therefore a circle is equal to 360° .

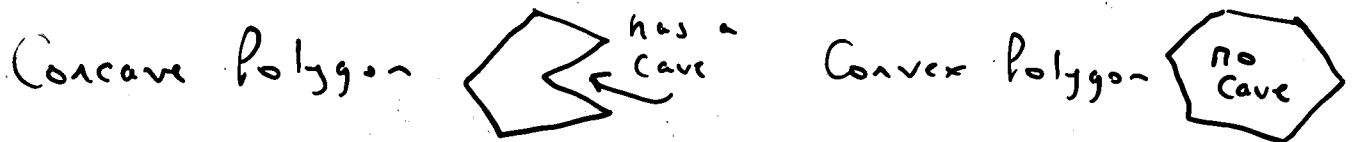
A polygon is a geometric figure with more than one angle. A polygon must be simple (no crossing lines), closed (no open sides) and all sides must be straight.



Endpoints of polygons are called vertices (vertex). The vertices are equal to the number of sides.



Know Names of 3 - 13 sided polygons



The sum of the measures of a triangle's 3 angles is equal to 180°

Isosceles - at least 2 equal sides

Equilateral - 3 equal sides

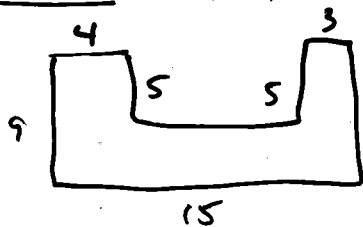
Scalene - 3 different lengths

Equiangular - 3 equal angles.

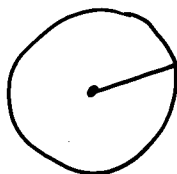
* In any triangle, the angles opposite sides of equal length are equal.

Lesson 3: Perimeter - Circumference

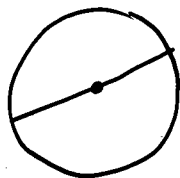
The Perimeter is the distance around an object.



$$9 + 4 + 5 + 5 + 3 + 15 (+ 8 + 9) = 58 \text{ inches}$$



Radius



diameter
(2 x's the radius)

The perimeter of a circle is called circumference.
The diameter will go around a circle about 3.14 times.

~~The diameter of a circle is about~~

Therefore we say the Circumference $\approx 3.14 \times D$
(approximately equal to)

$$\text{or } C = \pi D$$

LESSON 4: Review of Arithmetic

A number is an idea. A digit or symbol is a numeral

Natural or Counting Numbers ~~are~~

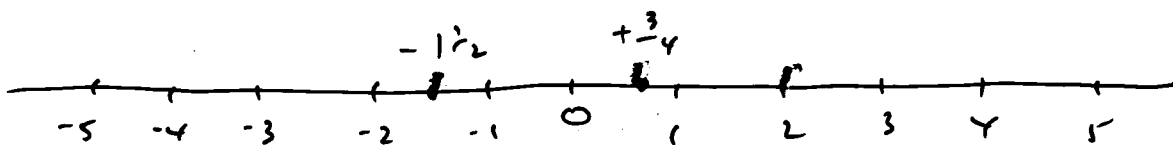
are ~~are~~ 1, 2, 3, 4, 5, 6, 7, 8, 9

Real Numbers

All positive numbers that can be used to describe a physical distance and their negative counterparts. Real numbers also include "0".

0, 1, 2, $2\frac{1}{3}$, $2\frac{1}{2}$, $2\frac{3}{4}$, 3, 3.1, 3.23, 5...
... and all their negatives.

Number line:



The "zero" is the "Origin": By placing the number $\frac{3}{4}$ and $-1\frac{1}{2}$ on the ~~number line~~ number line, we have "graphed" them. The number is the "coordinate" of the dot we placed on the line.

Multiplying fractions:

$$a) \frac{1}{2} \times \frac{2}{3} = \frac{2}{6} \left(\frac{1}{3}\right) \quad b) \frac{3}{5} \times \frac{5}{6} = \frac{1}{2}$$

division of fractions

$$c) \frac{1}{2} \div \frac{2}{3} = \frac{1}{2} \times \frac{3}{2} = \frac{3}{4} \quad b) \frac{3}{5} \div \frac{5}{6} = \frac{3}{5} \times \frac{6}{5} = \frac{18}{25}$$

Review Decimals
Unit Multiplier

LESSON 5: SETS · Absolute Value · Addition of Signed Numbers

A set ~~define~~ designates a well-defined collection of numbers. We enclose sets with braces: $A = \{1, 2, 3, \dots\}$

$$\text{Natural numbers} = \{1, 2, 3, 4, 5, \dots\}$$

$$\text{Whole numbers} = \{0, 1, 2, 3, 4, \dots\}$$

$$\text{Integers} = \{\dots, -3, -2, -1, 0, 1, 2, 3, \dots\}$$

Absolute Value is the distance a number is from "zero".
The absolute value of zero is zero. The absolute value is always positive.

example

$$|7| = 7 \quad |-2| = 2$$
$$|-7| = 7 \quad |2| = 2$$

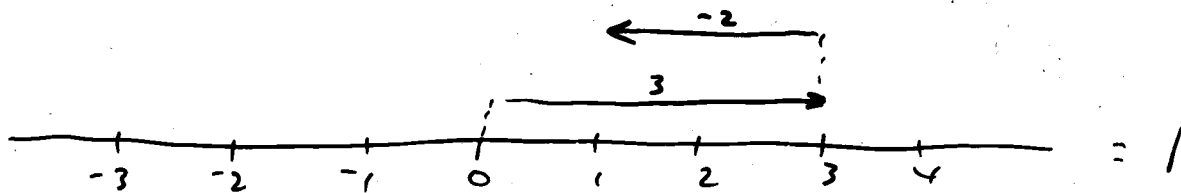
In algebra, addition & subtraction are lumped together in one operation called algebraic addition.

$$3 - 2 \text{ is written as } 3 + (-2)$$

or $(-2) + 3$

The order in which 2 real numbers are added does not affect the sum. This is called the Commutative property of Addition.

Using number line to $3 + (-2)$



Use number line to add $(-4) + (+2) + (-1) + (+5)$

