Angle Relationships and their Rules – Parallel Lines Cut by a Transversal

* Straight Angle Pair (windshield wiper) - Supplementary
* Vertical Angles - Congruent
* Corresponding Angles - Congruent
* Alternate Interior Angles - Congruent
* Same-Side Interior Angles - Supplementary

Are the lines parallel?

* What should the angles be, if the lines were parallel?
  + Ex. If you have two angles that are corresponding, then they should be congruent.
* Is that what they are? (Yes 🡪 Parallel; No🡪Not parallel)

Areas of:

* Triangles = (1/2)(b)(h)
  + Drawing in the height: train method
  + Height must be:
    - Coming down from the opposite vertex (the vertex across from the base)
    - Forming a right angle at the base.
  + If we ONLY know three side lengths, we still cannot find the area unless:
    - The triangle is a Right Triangle (only in this case is the height simply one of the side lengths, because it is meeting the base at a right angle)
    - The triangle is an Isosceles Triangle. Then we can draw in the height which BISECTS the base (cuts the base in half). We now have two smaller right triangles and we can use the Pythagorean Thm. to find the height.
* Parallelograms = (b\*h)
  + Same formula as a rectangle. But remember the HEIGHT in a PARALLELOGRAM is not a side length, it is an invisible line inside of the parallelogram that forms right angles (unless your parallelogram is a rectangle).
* Trapezoids = (1/2)(b1+b2)(h)
  + This is just a slight variation from the parallelogram/rectangle formula – b\*h. But, now we have two different bases, so it is the AVERAGE of the two bases times the height.

Pythagorean Theorem (ONLY works for right triangles.)

Triangle Inequality: a + b > c

* The two smallest sides together must be bigger than the longest side

If-Then Statements

* Example: If two lines are cut by a transversal and alternate interior angles are congruent, then the lines are parallel.
* If two parallel lines are cut by a transversal, then alternate interior angles are congruent.
* (These are both true because you cannot have one without the other. For most cases, however, for example, If you live in Davis then you live in California, the converse (reverse) is not true.