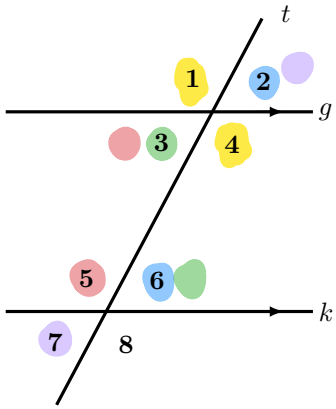
Artifact 10 – Parallel Lines and Transversals

Driving Question: When a line cuts two parallel lines, which of the eight angles are equal, and how do you know?

Example 1

Line g is parallel to line k. Line t is a transversal.

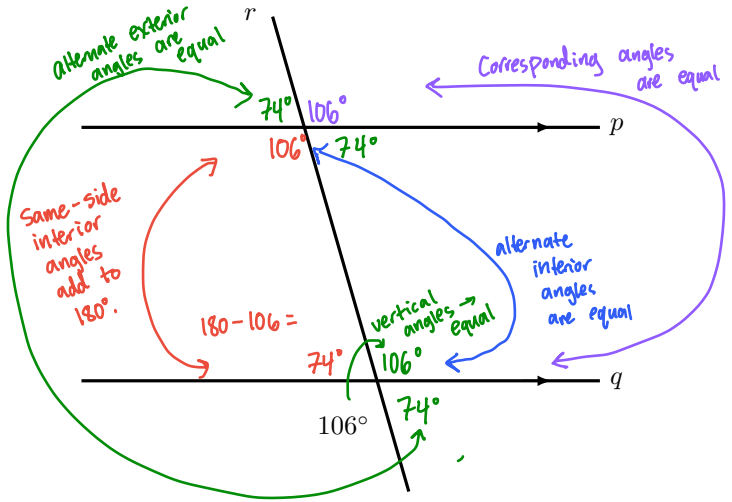


Pair	Angles	They are
vertical	1 & 4, 2 & 3, 5 & 8, 6 & 7	equal
corresponding	1 & 5, 2 & 6, 3 & 7, 4 & 8	equal
alternate interior	3 & 6, 4 & 5	equal
alternate exterior	1 & 8, 2 & 7	equal
same-side interior	3 & 5, 4 & 6	a sum of 180°

Slide the top crossing down line t until it sits on the bottom crossing. A slide is a translation, and a translation keeps every angle measure.

Example 2

Line p is parallel to line q. One angle measures 106°.



Vocabulary

vertical angles – the opposite angles formed by two intersecting lines; they are equal

parallel lines – lines in the same plane that never meet (marked with arrows)

transversal – a line that crosses two or more other lines

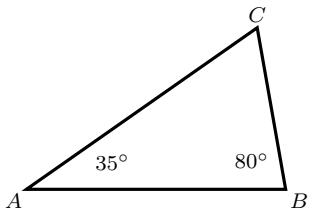
corresponding angles – angles in the same position at each crossing; equal when the lines are parallel

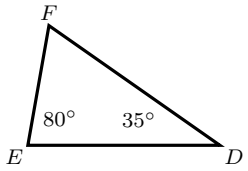
alternate interior angles – angles between the two lines, on opposite sides of the transversal; equal when parallel

same-side interior angles – angles between the two lines, on the same side of the transversal; supplementary when parallel

similar triangles – triangles with equal corresponding angles and proportional sides (symbol ∼)

angle-angle (AA) criterion – if two angles of one triangle equal two angles of another, the triangles are similar

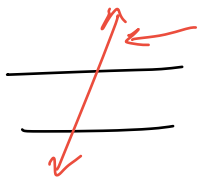




$\triangle ABC \sim \triangle DEF$

Notes to Forgetful Self

∠s = angles



A transversal, when cutting two parallel lines, creates equal
- → corresponding ∠s
- → alternate exterior ∠s
- → alternate interior ∠s
- → vertical ∠s

& supplementary (add to 180°)
- → same-side interior ∠s

* If two triangles share two of the same interior angles, they must also share a third equal interior angle measure & must be similar.
  * Angle-Angle (AA) criterion