

Angles Formed by a Transversal Intersecting Two Parallel Lines

Goal:

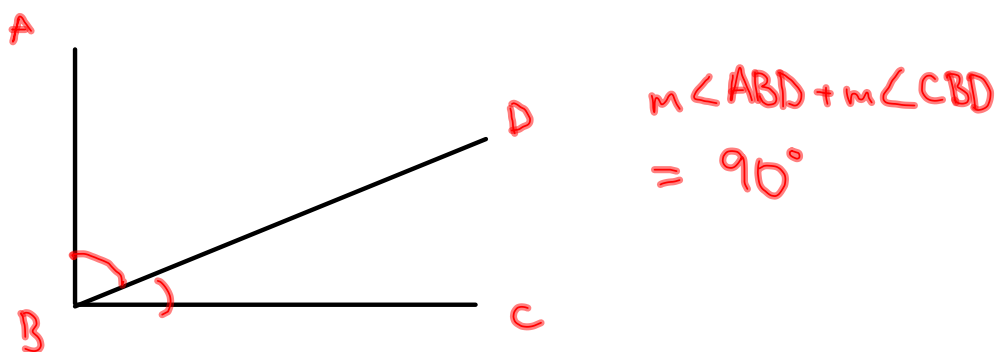
- to identify the angles formed by name
- to recognize which angles are congruent

To proceed we need to remember some terminology:

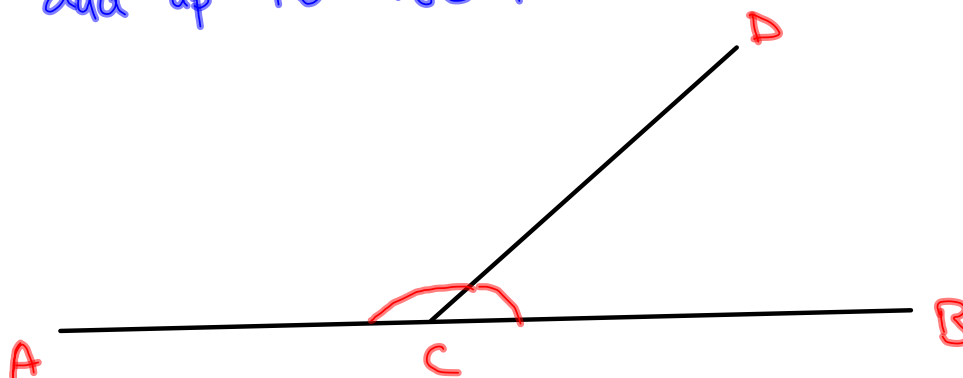
An angle is formed when two **rays** meet at a **vertex**.



Two adjacent angles are **complimentary** when... *they add (next to each other) up to 90°*

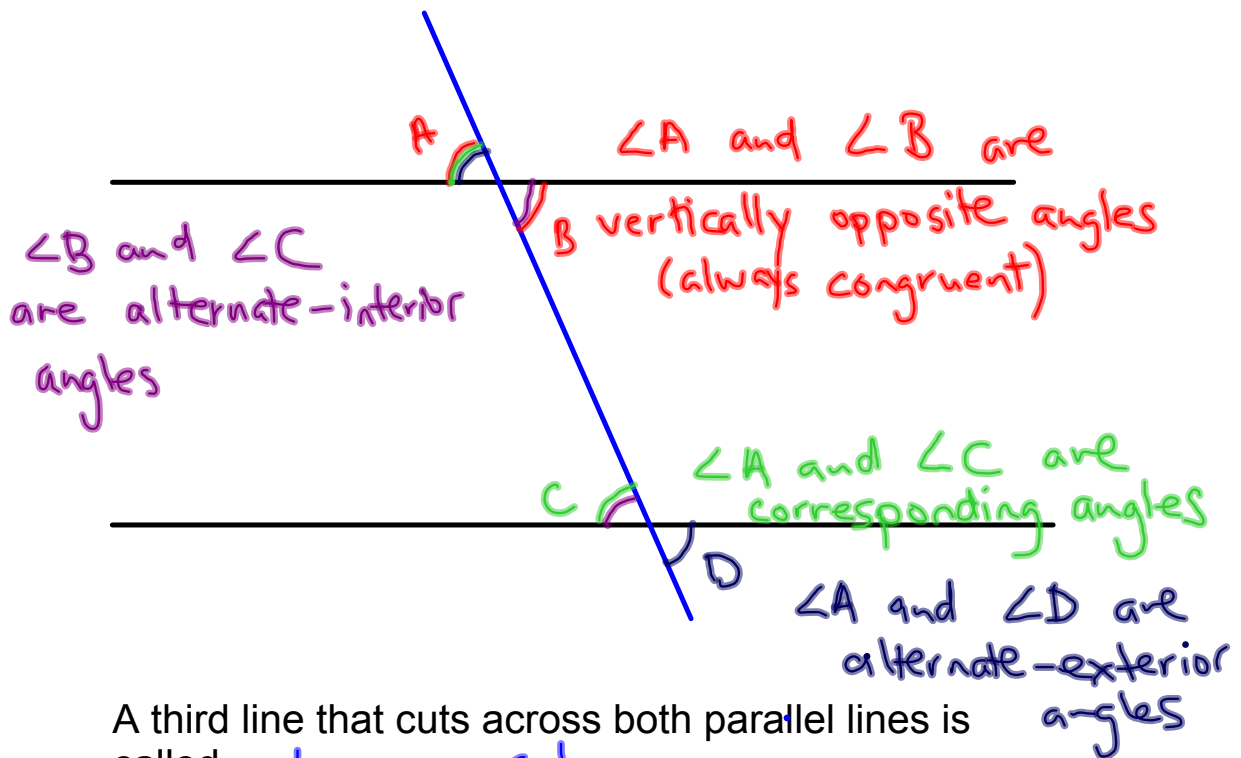


Two adjacent angles are **supplementary** when... *they add up to 180°* .



$$m\angle ACD + m\angle BCD = 180^\circ$$

Here we have two parallel lines:

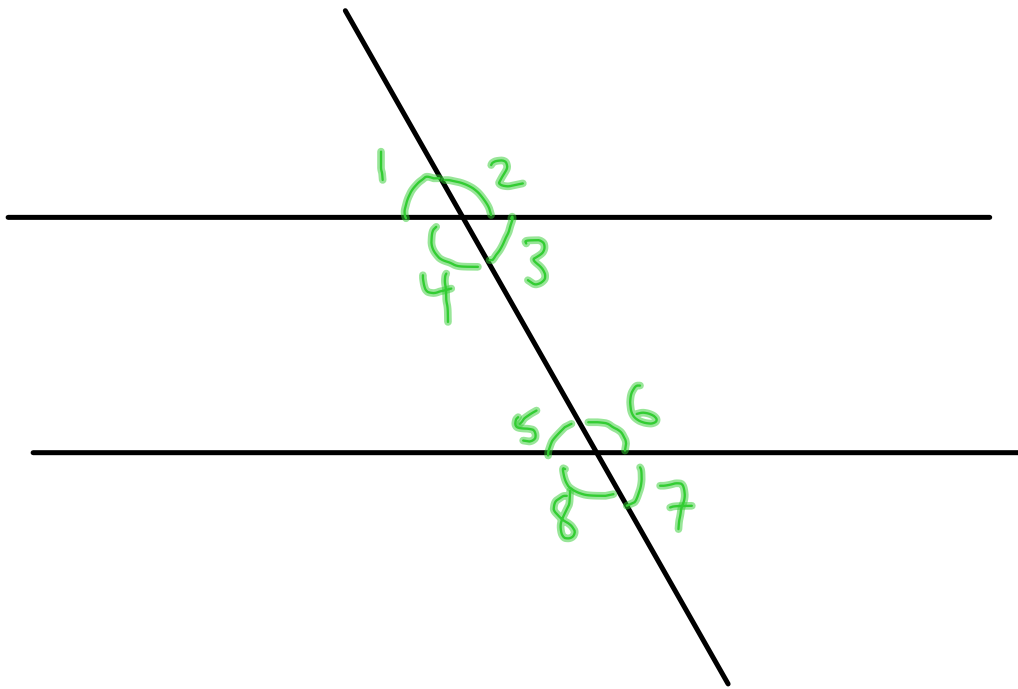


A third line that cuts across both parallel lines is called.... **transversal**

This line forms **8** angles

Several pairs of these angles have names. They are corresponding, alternate-interior or alternate-exterior angles.

Corresponding angles: are on the same side of the transversal (i.e. left or right) and the same side of the parallel lines (above or below)



$\angle 1$ and $\angle 5$

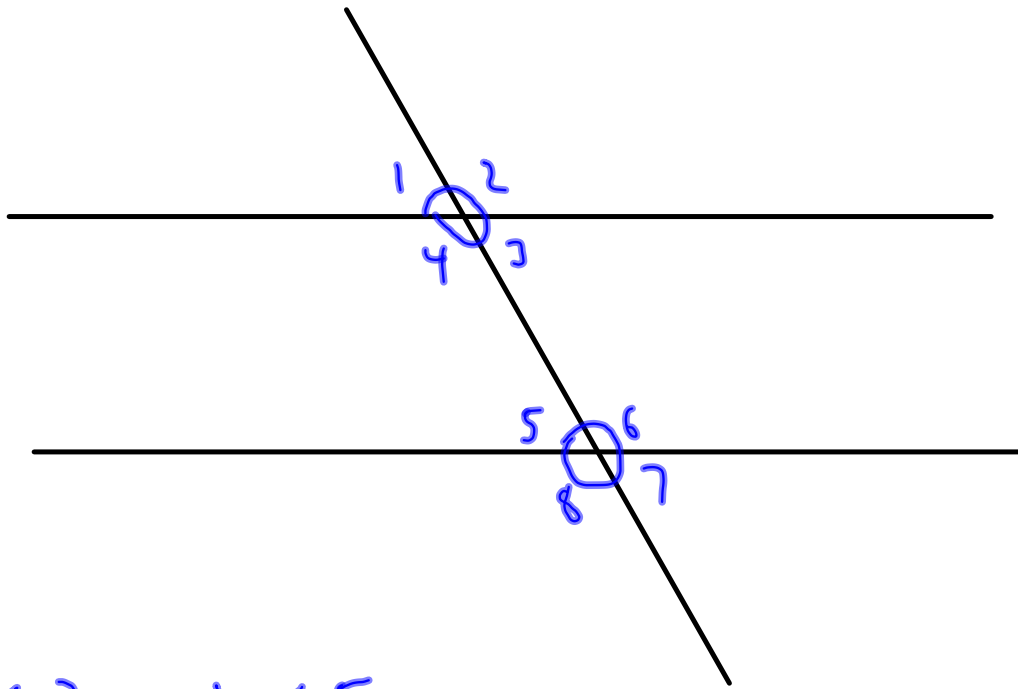
$\angle 2$ and $\angle 6$ are corresponding angles

$\angle 3$ and $\angle 7$

$\angle 4$ and $\angle 8$

Geometric statement: When a transversal passes across parallel lines, corresponding angles are congruent.
↳ same shape / equal

Alternate-interior angles: are on opposite (alternate) sides of the transversal, and inside parallel lines (interior)



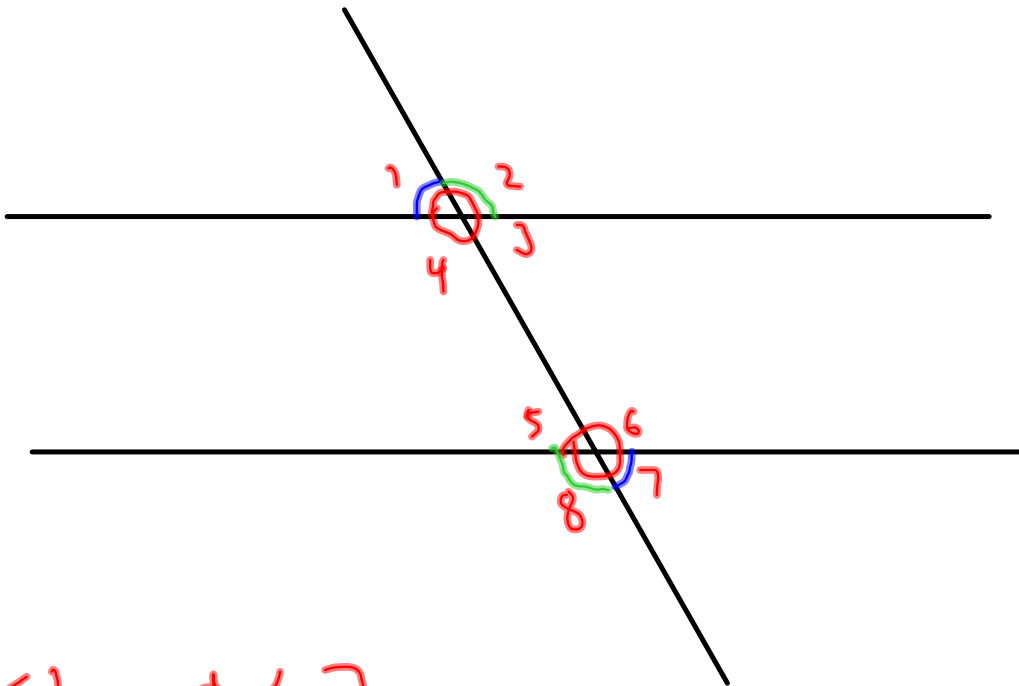
$\angle 3$ and $\angle 5$

$\angle 4$ and $\angle 6$

are alternate-interior angles

Geometric statement: When a transversal passes across parallel lines, alternate-interior angles are congruent.
↳ same shape / equal

Alternate-exterior angles: are on opposite sides of the transversal and are outside the parallel lines



$\angle 1$ and $\angle 7$

$\angle 2$ and $\angle 8$ are alternate-exterior angles

Geometric statement: When a transversal passes across parallel lines, alternate-exterior angles are congruent.
↳ same shape / equal

p.155

#13.

$$a) \underset{\uparrow}{m\angle BCD} = 94^\circ$$

measure of

$$180^\circ - (48^\circ + 38^\circ) = 94^\circ$$

Geo statement: The sum of interior angles in a triangle is 180° .

$$b) m\angle GHD \cong m\angle CDB \text{ (corresponding)} \\ = 38^\circ$$

Geo statement: When a transversal crosses parallel lines corresponding angles are congruent.

c) Geo statement: vertically opposite angles are congruent.

$$d) m\angle CBD = 48^\circ$$

$$\text{so } m\angle DBG = 180 - 48^\circ = 132^\circ$$

geo statement: supplementary angles

$$\angle DBG \cong \angle BGF$$

geo statement: when a transversal passes across parallel lines, alternate-interior angles are congruent.

Homework: p.155 #14