Chapter 3 § 2

Angles and Parallel Lines

Postulate :

Corresponding Angles Postulate – If two pair of parallel lines are cut by a transversal, then each pair of corresponding angles is congruent.

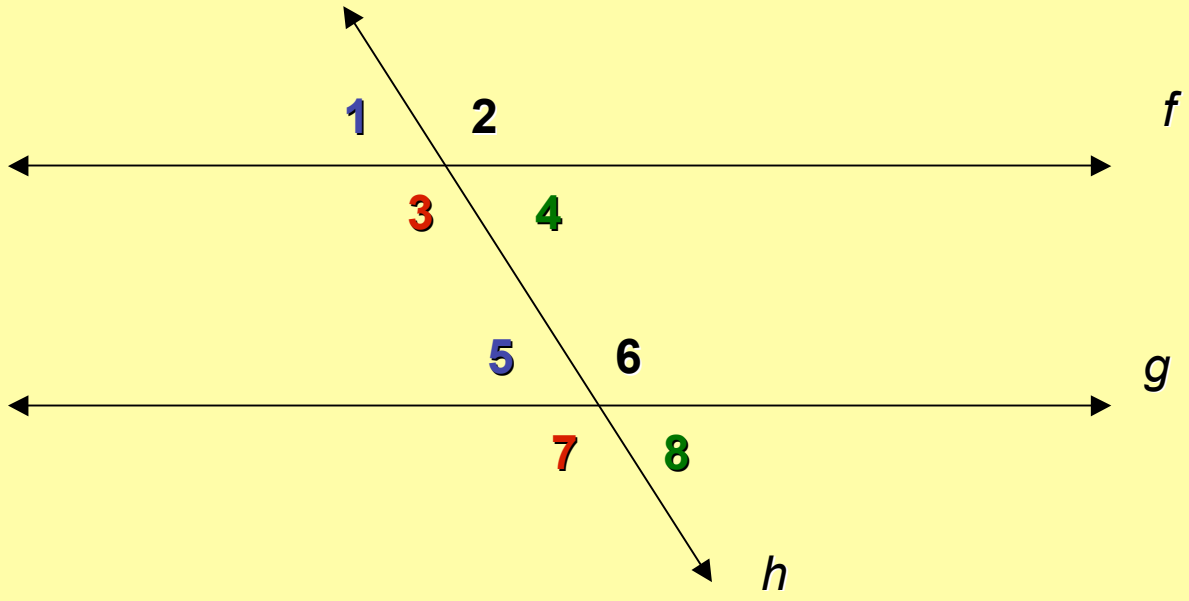
Theorem :

Alternate Interior Angle Theorem (3-1) – If two lines are cut by a transversal, then each pair of alternate interior angles is congruent.

Consecutive Interior Angle Theorem (3-2) – If two parallel lines are cut by a transversal, then each pair of consecutive interior angles is supplementary.

Alternate Exterior Angle Theorem (3-3) – If two parallel lines are cut by a transversal, then each pair of alternate exterior angles is congruent.

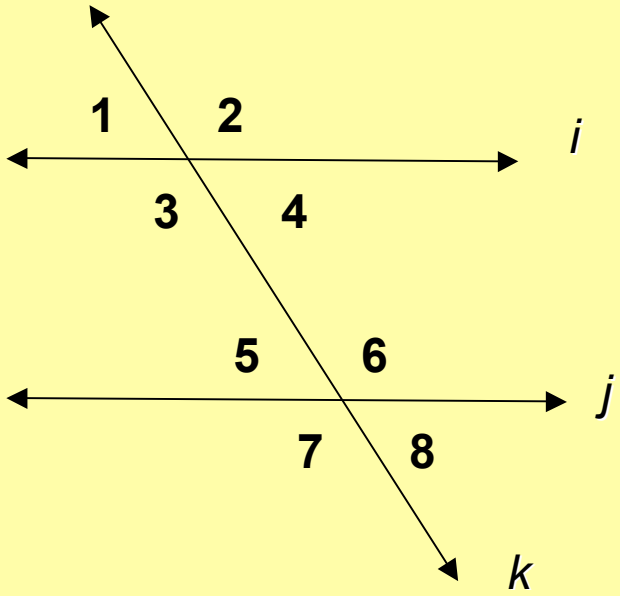
Perpendicular Transversal Theorem (3-4) – In a plane, if a line is perpendicular to one of two parallel lines, then it is perpendicular to the other.



According to the corresponding angle postulate, the following angles are congruent:

∠1 and ∠5 ∠3 and ∠7

∠2 and ∠6 ∠4 and ∠8



∠1 = 70

∠2 = 110

∠3 = 110

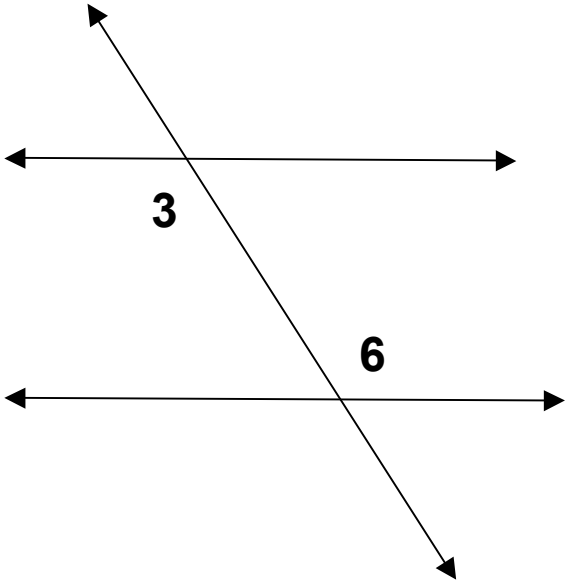
∠4 = 70

∠5 = 70

∠6 = 110

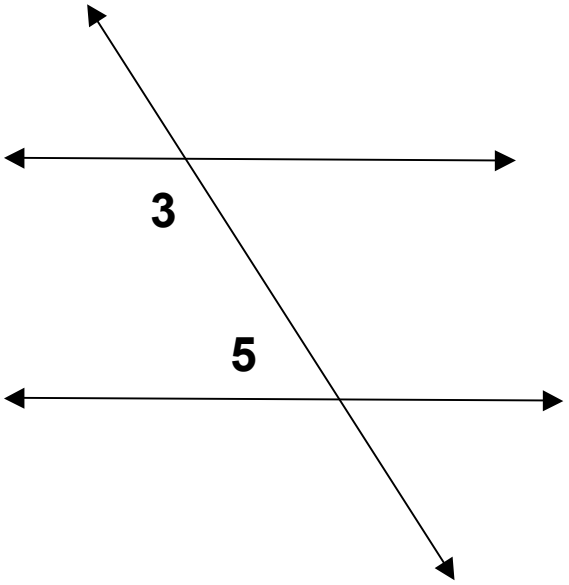
∠7 = 110

∠8 = 70



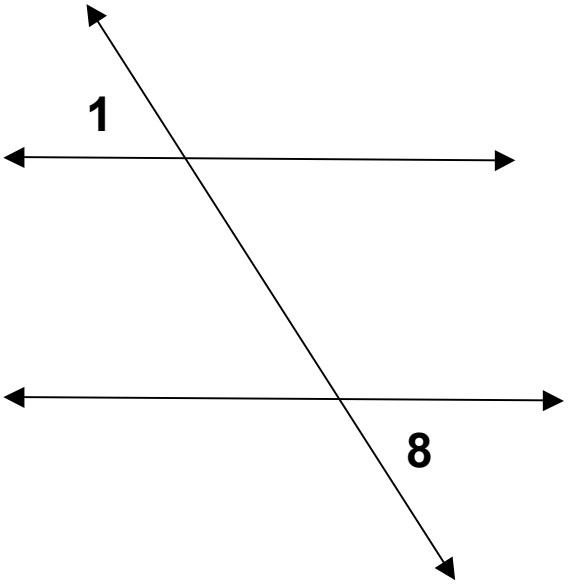
Alternate Interior Angle Theorem

$\angle 3 \cong \angle 6$



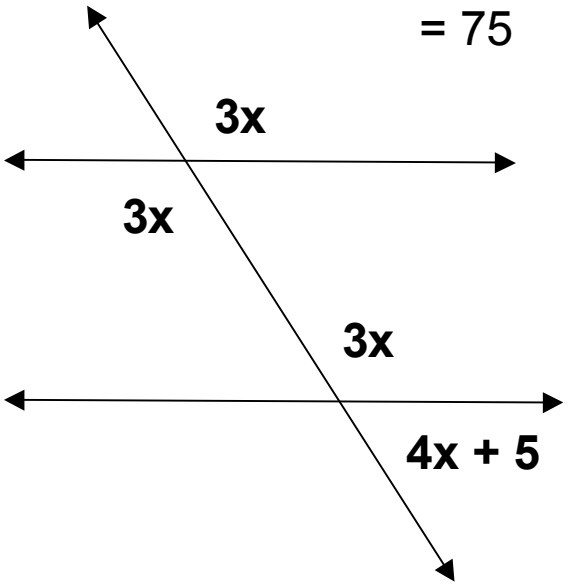
Consecutive Interior Angle Theorem

$\angle 3 + \angle 5 = 180$



Alternate Exterior Angle Theorem

$\angle 1 \cong \angle 8$



$3x + 4x + 5 = 180$

$7x + 5 = 180$

$-5 \quad -5$

$\frac{7x}{7} + 0 = \frac{175}{7}$

$x = 25$