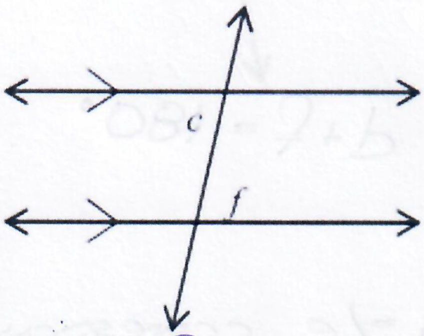
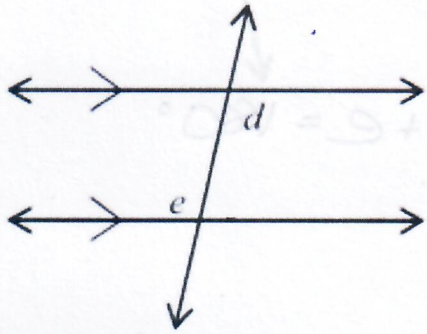
Lesson #2.2 – Angles Formed by Parallel Lines

In lesson 2.1 we learned that when a transversal line crosses parallel lines, the corresponding angles are equal. There are two other sets of angles that have a relationship when a transversal cross a pair parallel lines.

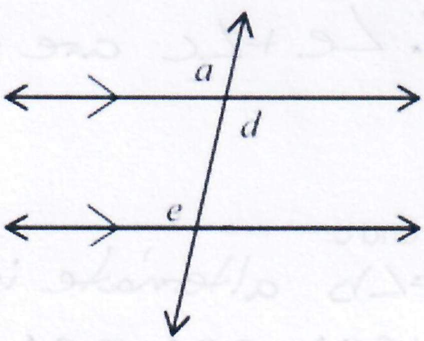
Alternating Interior Angles:
When a transversal intersects a pair of parallel lines, the alternat interior angles are equal.





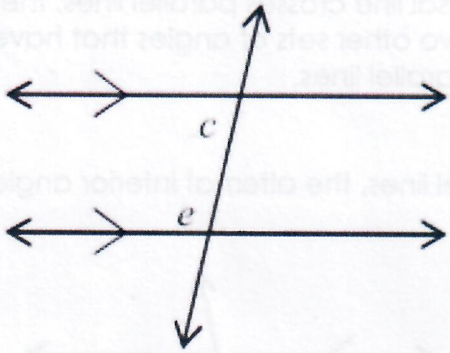
$c = f$ $\qquad$ $e = d$

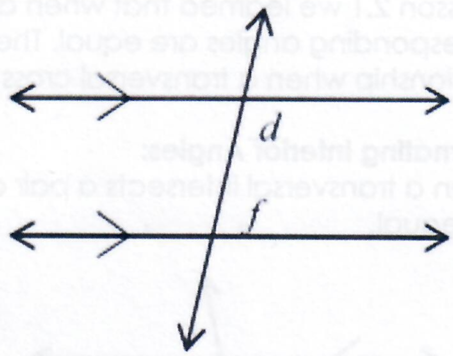
Proof:



$\angle a = \angle e$ corresponding $\angle$'s
$\angle a = \angle d$ vertically opposite $\angle$'s
$\angle d = \angle e$ alternate interior $\angle$'s
$\therefore$ both $= \angle a$

Co-Interior Angles:
When a transversal intersects a pair of parallel lines, the co-interior angles are supplementary.

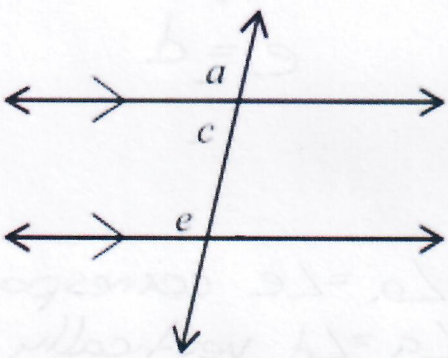




$c + e = 180°$

$d + f = 180°$

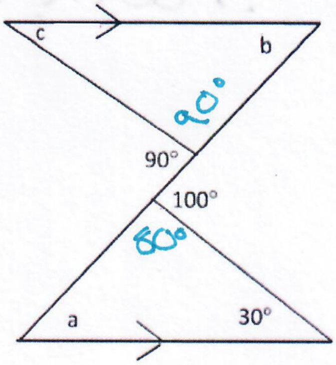
Proof:



$\angle a = \angle e$ corresponding $\angle$'s
$\angle a + \angle c = 180°$ $\angle$'s on a line $= 180°$
$\angle e + \angle c = 180°$ b/c $\angle e = \angle a$ "substitution"

$\therefore \angle e + \angle c$ are supplementary

Example 1: Determine the measure of a, b and c.



$\angle a = \angle b$ alternate interior angles
$\angle a = 180° - 80° - 30° = 70°$ sum of angles in a Δ
$\therefore \angle b = 70°$

$\angle c = 180° - 90° - 70° = 20°$ sum of angles in a triangle