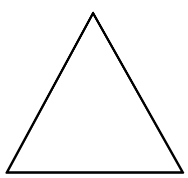
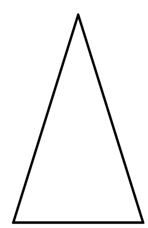
FOM 11 **Geometric Properties Review**

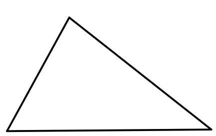
Angle Properties

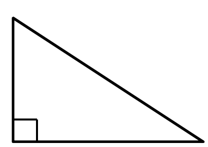
Acute	Right	Complimentary
Obtuse	Straight	Supplementary
Angles on a line	Reflex	Angles at a point
	Vertically opposite angles	

Triangle Properties

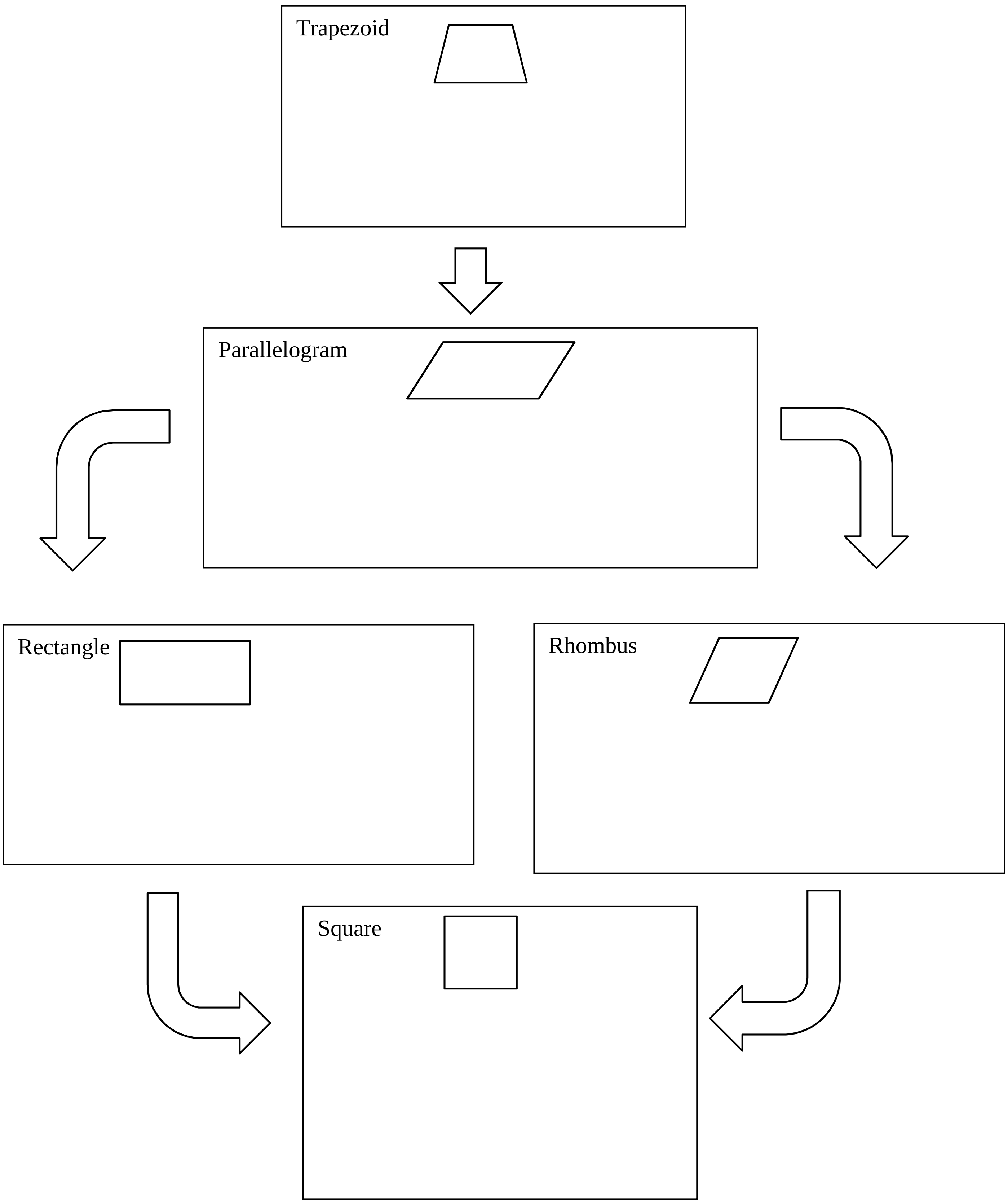








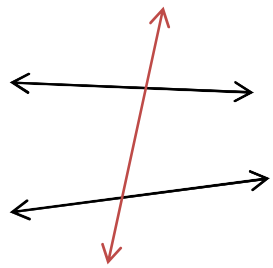
Quadrilateral Properties



Assignment: Geometric Properties Worksheet

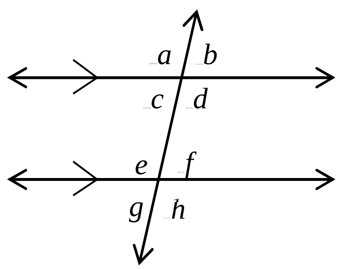
Parallel Lines and Transversals

A **transversal** is a line that intersects two or more other lines at distinct points.

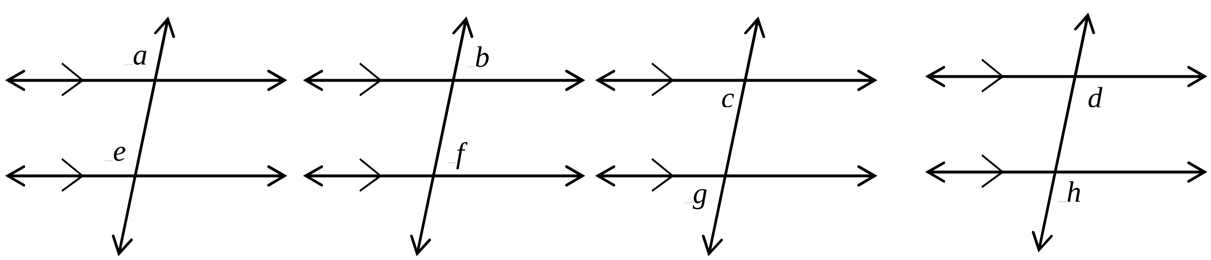


Parallel lines are lines with the same slope but different *y*-intercepts. Parallel lines will never intersect each other.

If two parallel lines are cut by a transversal, eight angles are created.

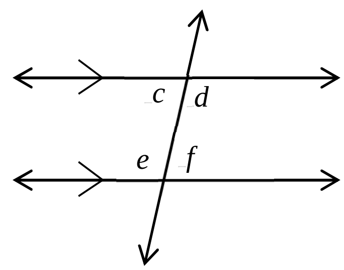


Corresponding angles are on the same side of the transversal, and on the same side of the parallel lines. (They are in the same position)



Interior angles lie inside the parallel lines.

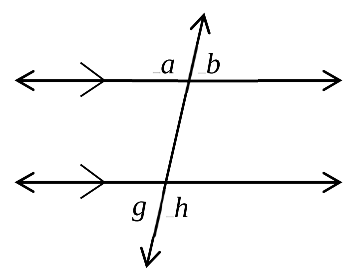
Co-Interior Angles: Interior angles on the same side of the transversal.



Alternate Interior Angles: Interior Angles on opposite sides of the transversal.

Exterior angles lie outside the parallel lines.

Co-Exterior Angles: Exterior angles on the same side of the transversal.



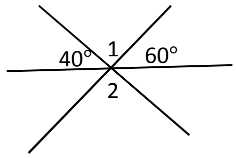
Alternate Exterior Angles: Exterior angles on opposite sides of the transversal.

If two parallel lines are cut by a transversal then Corresponding Angles, Alternate Interior Angles, & Alternate Exterior Angles are equal.

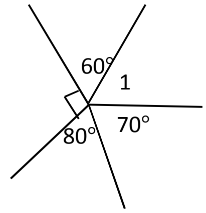
Likewise, if two lines are cut by a transversal and the Corresponding Angles, or Alternate Interior Angles, or the Alternate Exterior Angles are equal then the lines are parallel.

Example 1: Find each indicated angle:

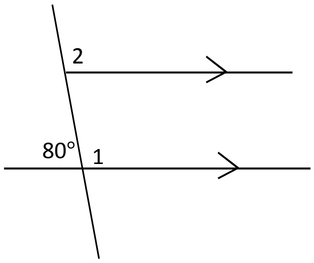
a.



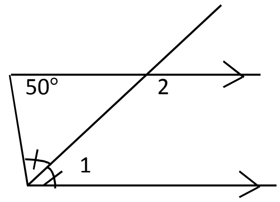
b.



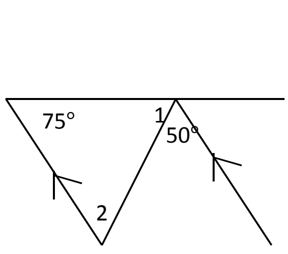
c.



d.



e.

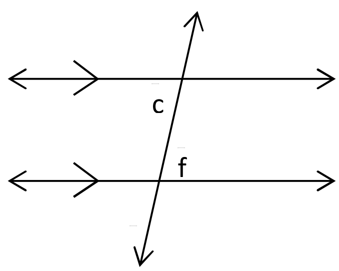


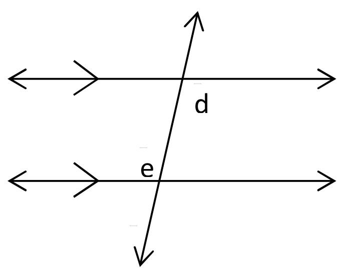
Assignment: Pg. 72 #2-6

FOM 11 **2.2 Angles Formed by Parallel Lines**

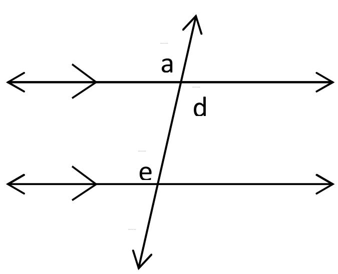
From last day we know that when a transversal crosses parallel lines, the corresponding angles are equal. There are two other sets of angles that have a relationship when a transversal crosses parallel lines.

Alternate Interior Angles
When a transversal intersects a pair of parallel lines, the **alternate interior angles** are equal.

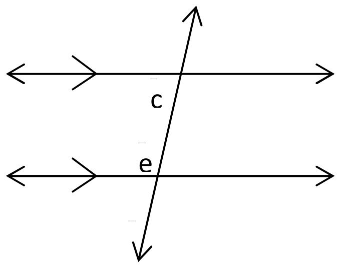


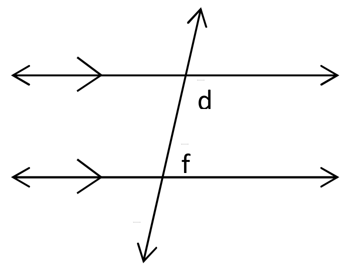


Proof:

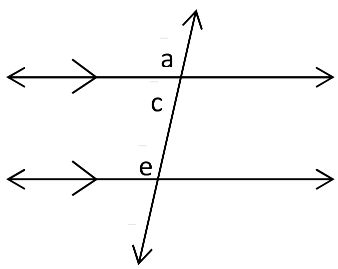


Co-Interior Angles:
When a transversal intersects a pair of parallel lines, the **co-interior angles** are supplementary.

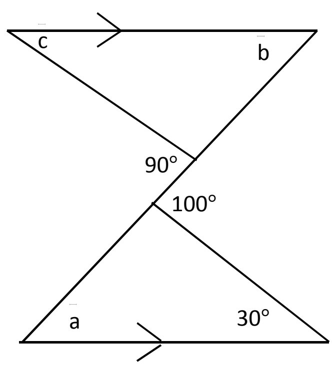




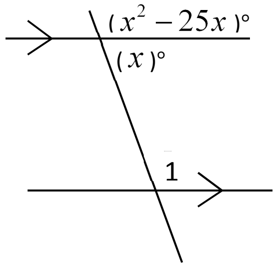
Proof:



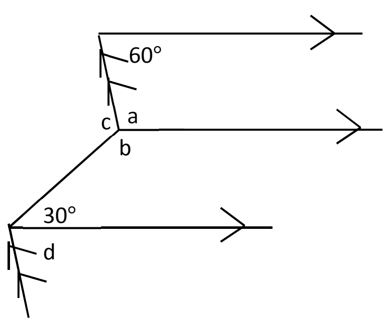
Example 1: Determine the measures of *a*, *b* and *c*.



Example 2: Find the measure of $\angle 1$.



Example 3: Determine the measures of *a*, *b*, *c* and *d*.



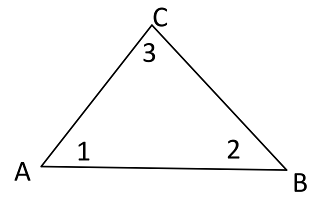
Assignment: pg. 78 #1-4, 10, 12, 13, 15, 16, 20

FOM 11 **2.3 Angle Properties In Triangles**

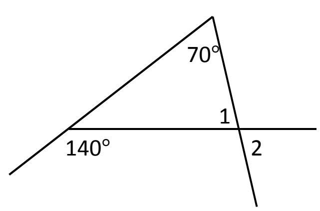
The sum of the angles in a triangle is 180°.

We can use our knowledge of parallel lines to prove (deductively) this theorem.

Example 1: Given ΔABC, prove $\angle 1 + \angle 2 + \angle 3 = 180°$.

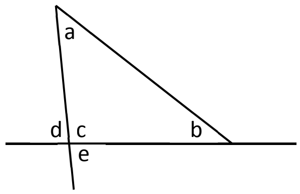


Example 2: Determine the measures of $\angle 1$ and $\angle 2$.

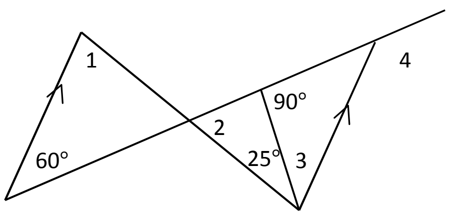


The measure of an exterior angle of a triangle is equal to the sum of the measures of the two non-adjacent interior angles.

Example 3: Prove $\angle e = \angle a + \angle b$.



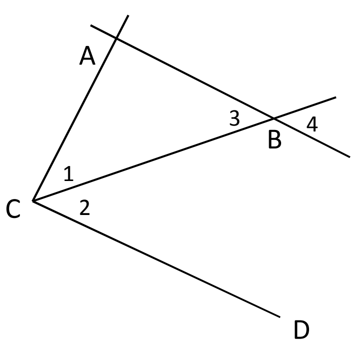
Example 4: Determine $\angle 1$, $\angle 2$, $\angle 3$, and $\angle 4$.



Example 5: Given $AB \parallel CD$

$\angle 1 = \angle 4$

Prove $\angle 1 = \angle 2$



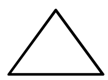
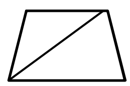
Assignment: pg. 90 #2, 3, 5-9, 12, 15, 16, 18

FOM 11 **2.4 Angle Properties in Polygons**

A **polygon** is a closed geometric figure made up of *n* straight sides.

A **convex polygon** has all interior angles less than 180°.

A **concave polygon** has at least one interior angle greater than 180°.

# of sides in a polygon	sketch	# of triangles formed	Sum of interior angles of the polygon
3		1	$1\times180° = 180°$
4		2	$2\times180° = 360°$
5			
6			
7			
8			
9			
10			
11			
12			
n			

In any polygon with n sides, the sum of the interior angles is $180°(n-2)$. A **regular polygon** has equal sides and equal angles.

Example 1: Determine the measure of each interior angle of a regular 17-sided polygon.

The sum of the exterior angles of any convex polygon is 360°.

Each exterior angle of a regular polygon is $\frac{360^o}{n}$**.**

Example 2: Show that the sum of the exterior angles of a pentagon is 360°.

Example 3: What type of regular polygon has an interior angle 3 times the exterior angle?

Assignment: Pg. 99 #1-4, 6-11, 14, 18