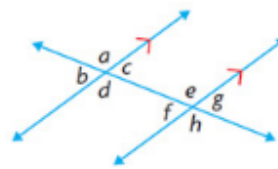


Parallels, Transverse Lines and their Angles

Compare your conjectures from the previous page with the following principles of angles formed by the intersection of parallels by transverse lines.

When a transversal intersects two parallel lines:

- i. the **corresponding** angles are equal.
- ii. the **alternate interior** angles are equal.
- iii. the **alternate exterior** angles are equal.
- iv. the interior angles on the same side of the transversal are **supplementary**.



- i) $a = e, b = f$
 $c = g, d = h$
- ii) $c = f, d = e$
- iii) $a = h, b = g$
- iv) $c + e = 180^\circ$
 $d + f = 180^\circ$

Now, consider this important argument, based on the principles above:

If a transversal intersects two lines such that

- i. the corresponding angles are equal, or
- ii. the alternate interior angles are equal, or
- iii. the alternate exterior angles are equal, or
- iv. the interior angles on the same side of the transversal are supplementary, then the lines are parallel.

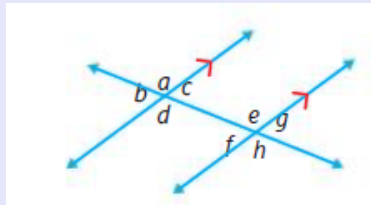
<http://regentsprep.org/Regents/math/geometry/GP8/PracParallel.htm>



SUMMARY

When a transversal intersects two parallel lines,

- the corresponding angles are equal
- the alternate interior angles are equal
- the alternate exterior angles are equal
- the co-interior angles are supplementary

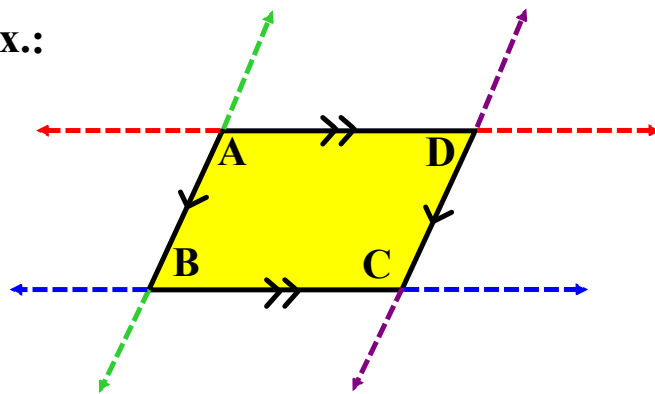


then the converse is true

If a transversal intersects two lines such that

- the corresponding angles are equal, or
- the alternate interior angles are equal, or
- the alternate exterior angles are equal, or
- the co-interior angles are supplementary

then the lines are parallel.

PARALLELOGRAM - 2 PAIRS OF PARALLEL LINES:**Ex.:**

CONCLUSION: opposite angles in a parallelogram are congruent (equal)

****congruent:** \cong