

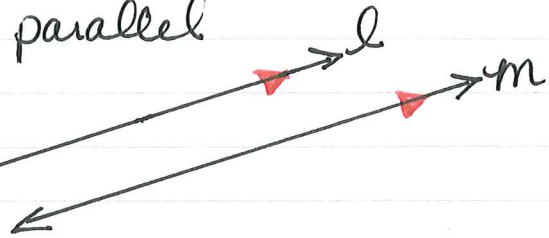
Chapter 3 - Parallel and Perpendicular Lines

3-1 Parallel Lines & Transversal

parallel lines = coplanar lines that do not intersect; lines that have the same slope.
symbol: \parallel means "is parallel to"

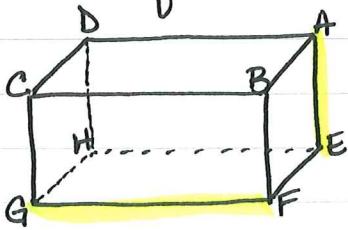
ex: lines l and m are parallel
 $l \parallel m$

red arrows indicate that lines are parallel



parallel planes = planes that do not intersect.

ex: the floor & ceiling



Which planes in the figure are parallel?

$ABC \parallel EFG$, $BCG \parallel ADH$,
 $ABF \parallel DCG$

Give one example of two planes that intersect. What is their intersection?

plane ABC intersects with plane CBG at \overline{CB} .

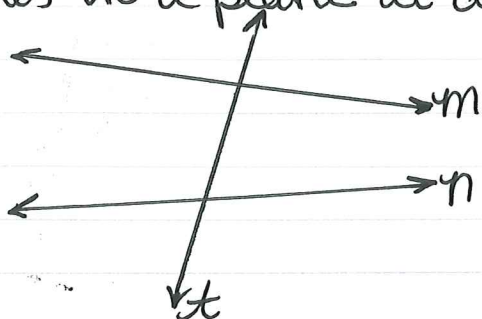
Which segments are parallel to \overline{BF} ?

\overline{AE} , \overline{DH} , \overline{CG}

* Notice in the above figure how \overline{AE} and \overline{GF} do not intersect and are not parallel (do not lie in the same plane), these are skew lines.

skew lines = lines that do not intersect and are not coplanar. \overline{AE} and \overline{GF}

transversal = a line that intersects two or more lines in a plane at different points.



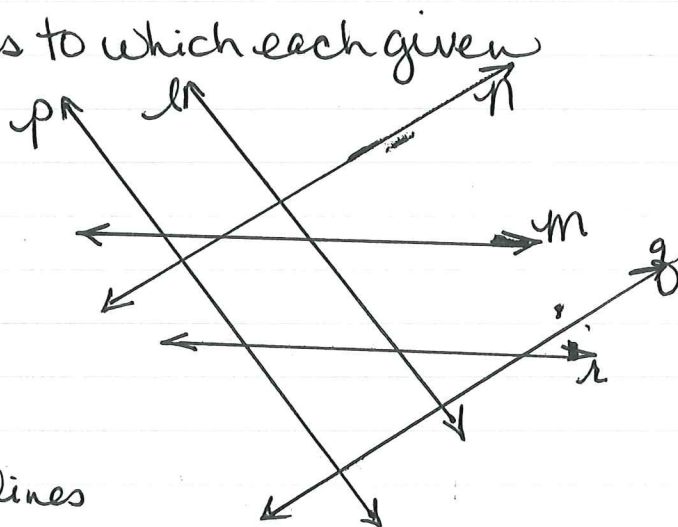
line t is the transversal of lines m and n .

ex: Identify the sets of lines to which each given line is a transversal.

a) line q is a transversal for lines p, l, r and m .

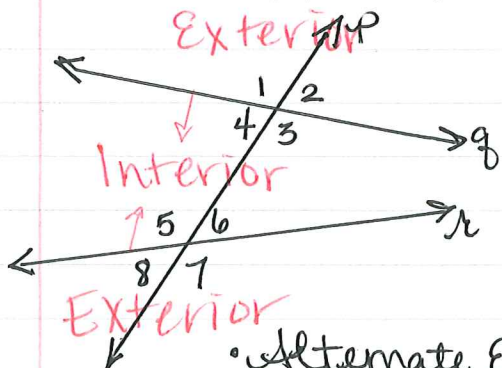
b) line m is a transversal for lines p, n, l & q .

c) line n is a transversal for lines p, m, l & r .



* Hint: imagine all lines are extended.

Transversals and Angles:



• Exterior angles: $\angle 1, \angle 2, \angle 8, \angle 7$
 • Interior angles: $\angle 3, \angle 4, \angle 5, \angle 6$

• Consecutive Interior angles:
 $\angle 3 \text{ \& } \angle 6, \angle 4 \text{ \& } \angle 5$

• Alternate Exterior angles:
 $\angle 1 \text{ \& } \angle 7, \angle 2 \text{ \& } \angle 8$

• Alternate Interior angles:
 $\angle 4 \text{ \& } \angle 6, \angle 3 \text{ \& } \angle 5$

• Corresponding Angles:
 $\angle 1 \text{ \& } \angle 5, \angle 2 \text{ \& } \angle 6, \angle 3 \text{ \& } \angle 7, \angle 4 \text{ \& } \angle 8$