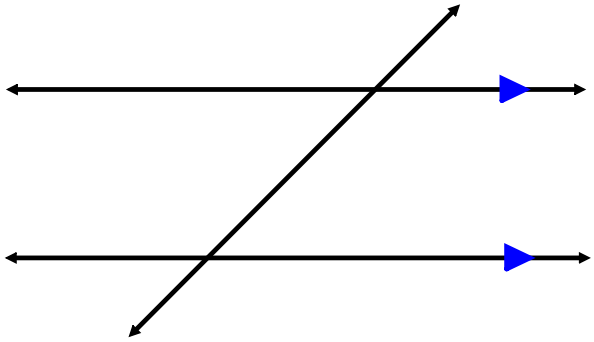
3.1 LINES & ANGLES

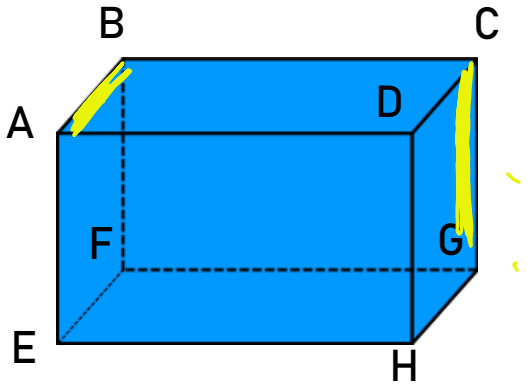
parallel lines- two lines in a plane that never meet

SYMBOL: ||

The arrows used in diagrams indicate that lines are parallel.



skew lines- two lines that do not intersect and are not in the same plane



$\overline{AB}$ & $\overline{CG}$ are skew. Can you name another pair?

EXAMPLE 1

A) Name all planes that are parallel to plane ABC.

plane THG

B) Name all segments that intersect $\overline{AB}$.

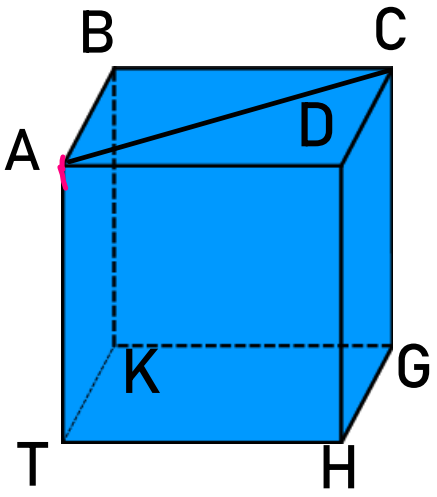
$\overline{CB}$, $\overline{AT}$, $\overline{KB}$, $\overline{AC}$, $\overline{DA}$

C) Name all segments that are parallel to $\overline{KG}$.

$\overline{TH}$, $\overline{AD}$, $\overline{BC}$

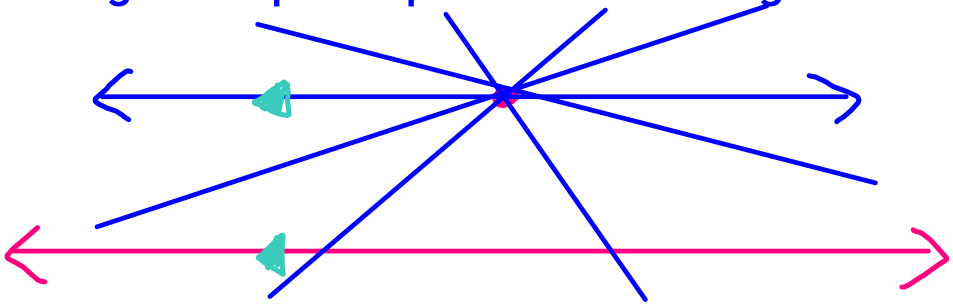
D) Name all segments that are skew to $\overline{TK}$.

$\overline{CA}$, $\overline{BC}$, $\overline{CG}$, $\overline{DA}$, $\overline{DH}$



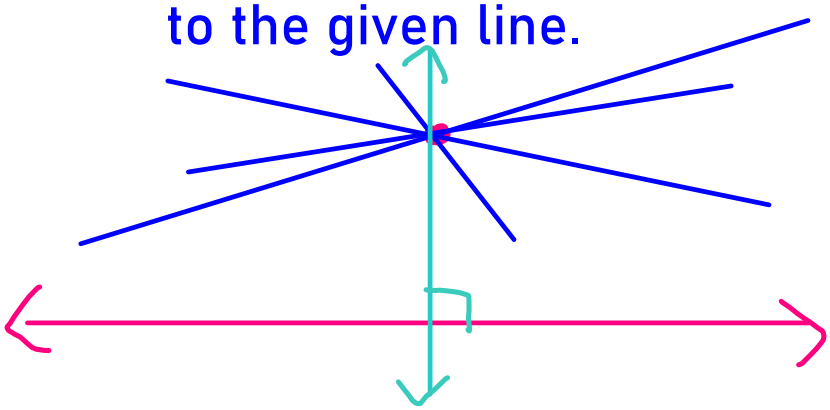
POSTULATE 13: Parallel Postulate

If there is a line and a point not on the line,
then there is exactly one line
through the point parallel to the given line.

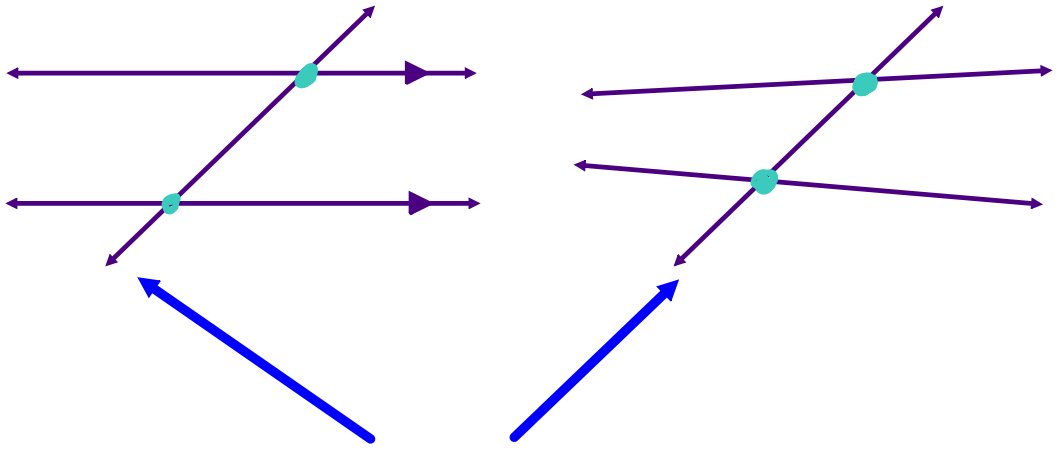


POSTULATE 14: Perpendicular Postulate

If there is a line and a point not on the line, then there is exactly one line through the point perpendicular to the given line.



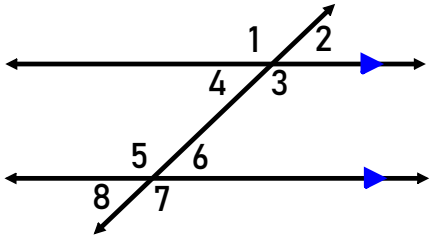
transversal- a line that intersects two or more lines in a plane at different points



transversal

SPECIAL ANGLES FORMED BY A TRANSVERSAL AND TWO LINES

EXTERIOR ∠s outside	∠1, ∠2, ∠7, ∠8
INTERIOR ∠s inside	∠3, ∠4, ∠5, ∠6
same-side CONSECUTIVE INTERIOR ∠s	∠4 & ∠5, ∠3 & ∠6
opposite ALTERNATE INTERIOR ∠s	∠4 & ∠6, ∠3 & ∠5
opposite ALTERNATE EXTERIOR ∠s	∠1 & ∠7, ∠2 & ∠8
CORRESPONDING ∠s same relative location	∠1 & ∠5, ∠2 & ∠6, ∠4 & ∠8, ∠3 & ∠7



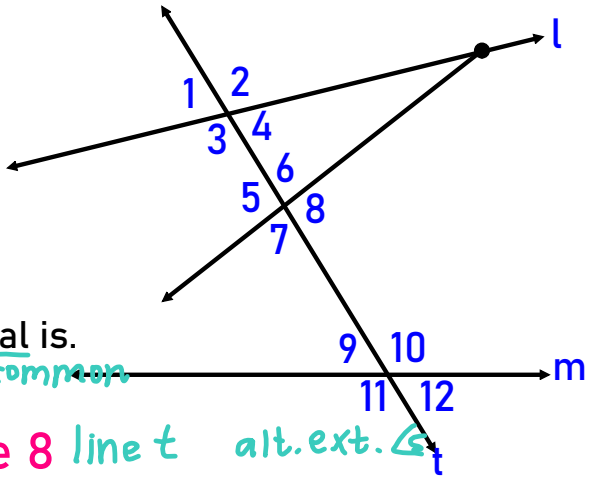
EXAMPLE 2

Identify each pair of angles as one of the following:

- alternate interior
- alternate exterior
- corresponding
- consecutive interior

and tell what the transversal is.

line they have in common



A) Angle 1 and Angle 8 line t alt. ext. ∠s

B) Angle 7 and Angle 10 line t alt. int. ∠s

C) Angle 8 and Angle 12 line t corr. ∠s

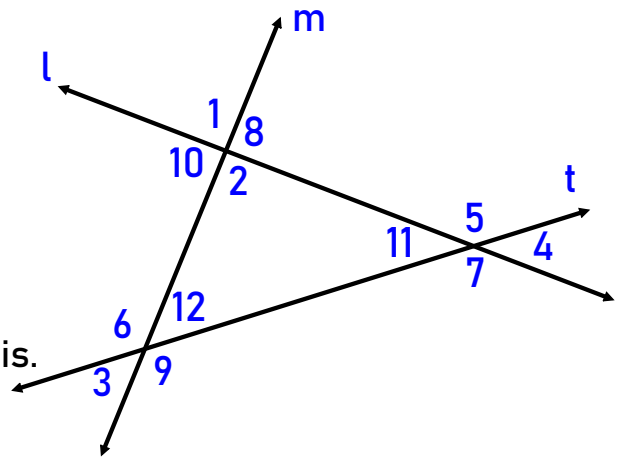
D) Angle 1 and Angle 5 line t corr. ∠s

E) Angle 4 and Angle 6 line t cons. int. ∠s

F) Angle 8 and Angle 9 line t alt. int. ∠s

EXAMPLE 3
Identify each pair of angles as one of the following:
- alternate interior
- alternate exterior
- corresponding
- consecutive interior

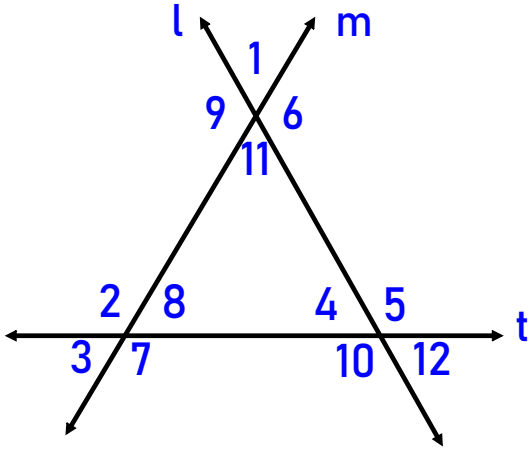
and tell what the transversal is.



A) Angle 6 and Angle 10 line m cons. int ∠s
B) Angle 9 and Angle 11 line t alt. int. ∠s
C) Angle 1 and Angle 5 line ℓ corr. ∠s
D) Angle 3 and Angle 8 line m alt. ext. ∠s
E) Angle 7 and Angle 12 line t alt. int. ∠s
F) Angle 4 and Angle 8 line ℓ corr. ∠s

EXAMPLE 4
A) Identify the transversal to lines l and m.

line t



B) Identify the special name given to each pair of angles.

- Angle 7 and Angle 12 corr. ∠s
- Angle 8 and Angle 10 alt. int. ∠s
- Angle 2 and Angle 12 alt. ext. ∠s