

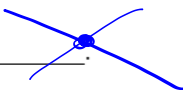
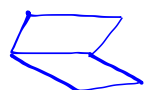

Geometry 1-2
Class-Notes

Name _____
Date _____ Period _____

3.1 Lines and Angles

Goal • Identify parallel, perpendicular, and skew lines. Identify the angles formed by two lines and a transversal.

Identify each of the following:

1. Points that lie in the same plane are called coplanar.
2. Two angles whose sum is 180° are supplementary. If their sum is 90° , then they are complementary.
3. Two lines intersect at a point. 
4. Two planes intersect at a line. 
5. A pair of adjacent angles that form a line are called a linear pair. 

Parallel, Perpendicular, and Skew Lines:

Parallel lines – coplanar lines that do not intersect.

examples: $\overline{RX} \parallel \overline{SY}$

Parallel planes – planes that do not intersect.

examples: PLANE $WXY \parallel$ PLANE QRS

"IS PERPENDICULAR TO" 

Perpendicular lines – Intersecting lines that form right angles.

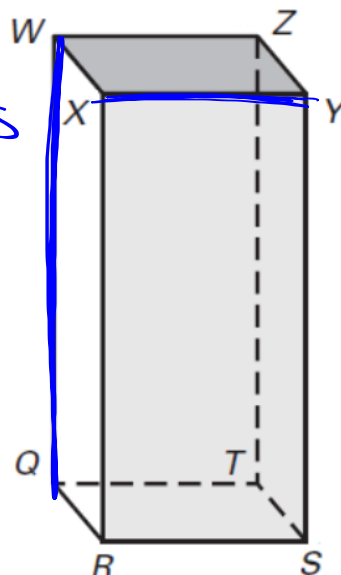
examples: $\overline{XY} \perp \overline{XR}$

Perpendicular planes – planes that intersect at a right angle

examples: $WXZ \perp WXR$

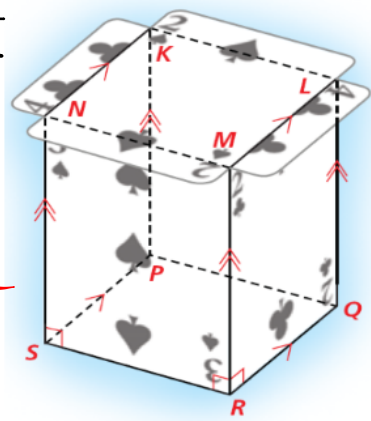
Skew Lines – lines that are not parallel, are not in the same plane, and do not intersect.

examples: $\overline{XY} \nparallel \overline{WQ}$



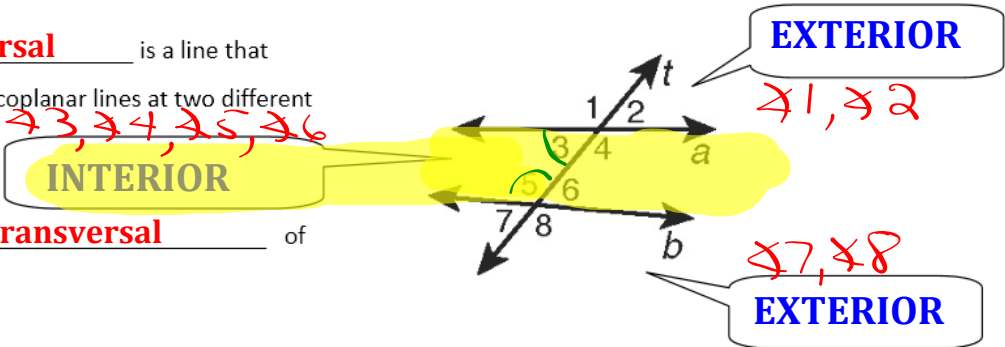
Example 1: Identifying Lines and Planes - Use the solid to identify each of the following.

- a. a pair of parallel segments $\overline{SN} \parallel \overline{RM}$
- b. a pair of parallel planes $NKL \parallel PQR$
- c. a pair of perpendicular segments $\overline{SR} \perp \overline{MR}$
- d. a pair of perpendicular planes $SRQ \perp MQL$
- e. a pair of skew lines \overline{MR} & \overline{NK}



Angle pairs formed by a transversal:

A transversal is a line that intersects two coplanar lines at two different points.

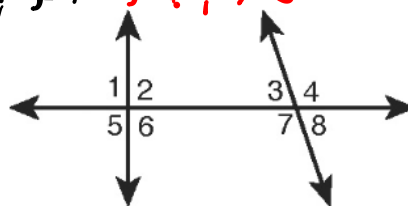


Line t is the transversal of lines a and b.

Angle Pairs Formed by a Transversal		
Angles	Description	Examples
Corresponding Angles	angles that lie on the same side of the transversal and on the same side of the other two lines.	$\angle 1, \angle 5$ $\angle 2, \angle 6$ $\angle 3, \angle 7$ $\angle 4, \angle 8$
Alternate Interior Angles	angles that lie on alternating sides of the transversal, on the interior of the other two lines.	$\angle 3, \angle 6$ $\angle 4, \angle 5$
Alternate Exterior Angles	angles that lie on alternating sides of the transversal, on the exterior of the other two lines.	$\angle 1, \angle 8$ $\angle 7, \angle 2$
Same-side Interior Angles	angles that lie on the same side of the transversal, on the interior of the other two lines; also called consecutive interior angles.	$\angle 3, \angle 5$ $\angle 4, \angle 6$

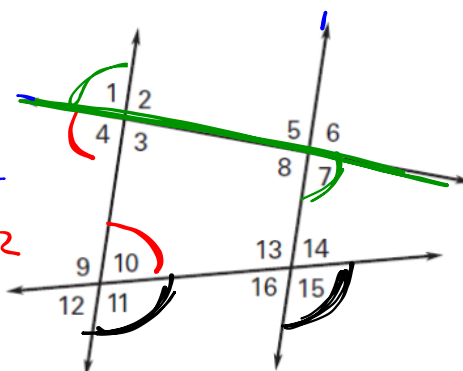
Example 2: Classifying Pairs of Angles. List all pairs of the indicated type of angle.

- a. corresponding angles ~~1~~ ~~3~~ ~~2~~ ~~4~~ ~~5~~ ~~7~~ ~~6~~ ~~8~~
- b. alternate interior angles ~~2~~ ~~7~~ ~~3~~ ~~6~~
- c. alternate exterior angles ~~1~~ ~~8~~ ~~4~~ ~~5~~
- d. same-side interior angles ~~2~~ ~~3~~ ~~6~~ ~~7~~
(consecutive interior angles)



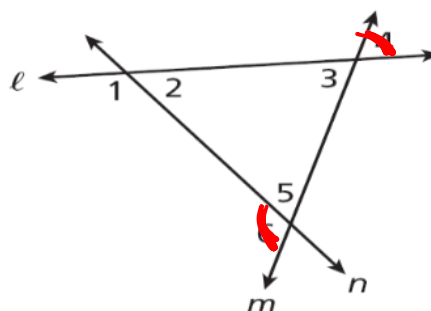
Example 3: Classify the angle pair as corresponding, alternate interior, alternate exterior, or same-side interior angles (consecutive interior angles).

- a. angles 8 and 13 SAME SIDE INTERIOR
- b. angles 4 and 10 ALTERNATE INTERIOR
- c. angles 1 and 7 ALT. EXT.
- d. angles 11 and 15 CORRESPONDING



Example 4: Identifying Angle Pairs and Transversals - Identify the transversal and classify each angle pair.

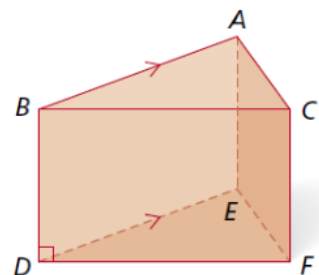
- a. $\angle 1$ and $\angle 3$ CORRESP
The transversal is l
- b. $\angle 2$ and $\angle 6$ ALTERNATE INT.
The transversal is n
- c. $\angle 4$ and $\angle 6$ ALT. EXT
The transversal is m



Homework:

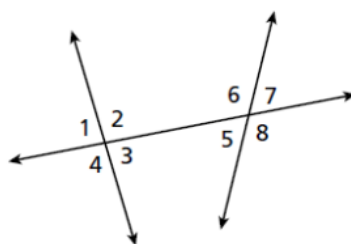
Identify each of the following.

14. one pair of parallel segments
15. one pair of skew segments
16. one pair of perpendicular segments
17. one pair of parallel planes



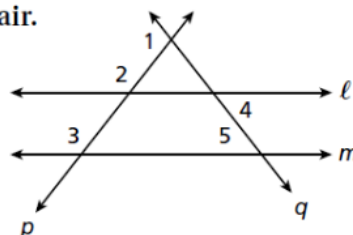
Give an example of each angle pair.

18. same-side interior angles
19. alternate exterior angles
20. corresponding angles
21. alternate interior angles



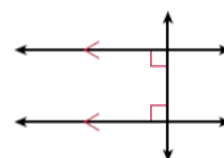
Identify the transversal and classify each angle pair.

22. $\angle 2$ and $\angle 3$
23. $\angle 4$ and $\angle 5$
24. $\angle 2$ and $\angle 4$
25. $\angle 1$ and $\angle 2$



46. Which type of lines are NOT represented in the diagram?

- ☐ A Parallel lines ☐ C Skew lines
☐ B Intersecting lines ☐ D Perpendicular lines



47. For two lines and a transversal, $\angle 1$ and $\angle 8$ are alternate exterior angles, and $\angle 1$ and $\angle 5$ are corresponding angles. Classify the angle pair $\angle 5$ and $\angle 8$.

- ☐ F Vertical angles
☐ G Alternate interior angles
☐ H Adjacent angles
☐ J Same-side interior angles

Name all the angle pairs of each type in the diagram. Identify the transversal for each pair.

49. corresponding
50. alternate interior
51. alternate exterior
52. same-side interior

