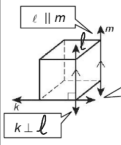
## Geometry Notes Section 3-1

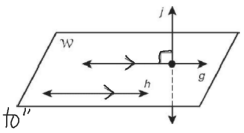
Oct 14

### Lines and Angles

| Lines | Description | Examples |
|---|---|---|
| **parallel** | lines that lie in the same plane and do not intersect<br>**symbol:** ∥ | $\ell \parallel m$  $k$ and $m$ are skew. $k \perp \ell$ |
| **perpendicular** | lines that form 90° angles<br>**symbol:** ⊥ | |
| **skew** | lines that do not lie in the same plane and do not intersect | |

**Parallel planes** are planes that do not intersect. For example, the top and bottom of a cube represent parallel planes.

**Use the figure for Exercises 1–3. Identify each of the following.**

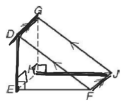



1. a pair of parallel lines
$h \parallel g$ → "is parallel to"

2. a pair of skew lines
$h, j$

3. a pair of perpendicular lines
$j \perp g$ → "is perpendicular to"

**Use the figure f or Exercises 4–9. Identify each of the following.**




4. a segment that is parallel to $\overline{DG}$
$\overline{FJ}$ or $\overline{EH}$

5. a segment that is perpendicular to $\overline{GH}$
$\overline{HJ}$ or $\overline{EH}$

6. a segment that is skew to $\overline{JF}$
$\overline{DE}$ or $\overline{GH}$

7. one pair of parallel planes
plane DEF & plane GHJ

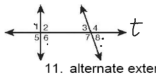
8. one pair of perpendicular segments, not including $\overline{GH}$
$\overline{DE} \perp \overline{EF}$ & $\overline{DE} \perp \overline{EH}$

9. one pair of skew segments, not including $\overline{JF}$
$\overline{DG}$ & $\overline{HJ}$, $\overline{DE}$ & $\overline{GJ}$

A transversal is a line that intersects two lines in a plane at different points. Eight angles are formed. Line $t$ is a transversal of lines $a$ and $b$.


| Angle Pairs Formed by a Transversal | | |
|---|---|---|
| **Angles** | **Description** | **Examples** |
| **corresponding** ∠S | angles that lie on the same side of the transversal and on the same sides of the other two lines |  |
| **alternate interior** ∠S | angles that lie on opposite sides of the transversal, between the other two lines |  |
| **alternate exterior** ∠S | angles that lie on opposite sides of the transversal, outside the other two lines |  |
| **same-side interior** ∠S | angles that lie on the same side of the transversal, between the other two lines; also called *consecutive interior angles* |  |

**Use the figure for Exercises 10–13. Give an example of each type of angle pair.**




10. corresponding angles

∠7 and ∠5; ∠8 and ∠6; ∠1 and ∠3; ∠2 and ∠4

11. alternate exterior angles

∠8 and ∠1; ∠5 and ∠4

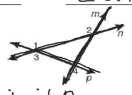
12. same-side interior angles

∠2 and ∠3; ∠6 and ∠7

13. alternate interior angles

∠2 and ∠7, ∠6 and ∠3

**Use the figure for Exercises 14–16. Identify the transversal and classify each angle pair.**




14. ∠1 and ∠2

n is transversal; same-side int. ∠s.

15. ∠2 and ∠4

transversal m; alt. ext. ∠s

16. ∠3 and ∠4

transversal p; corr. ∠s.