Geometry 3.1

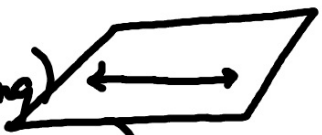
Identify the relationships between two lines or two planes
Name angle pairs formed by lines and transversals

parallel lines Same slope "coplanar" don't intersect

skew lines not parallel - 2 diff planes don't intersect

Spaghetti

parallel planes



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interior - inside (of something)

exterior outside (of something)

consecutive in a row (don't skip) NTWTK

alternate taking turns

corresponding

transversal

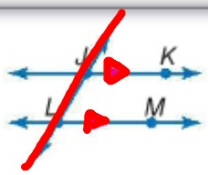
p.173

transversal

## KeyConcepts Parallel and Skew

**Parallel lines** are coplanar lines that do not intersect.

Example $\overleftrightarrow{JK} \parallel \overleftrightarrow{LM}$




Arrows are used to indicate that lines are parallel.

**Skew lines** are lines that do not intersect and are not coplanar.

Example Lines $\ell$ and $m$ are skew.


**Parallel planes** are planes that do not intersect.

Example Planes $\mathcal{A}$ and $\mathcal{B}$ are parallel.

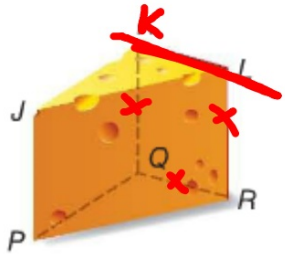

$\overleftrightarrow{JK} \parallel \overleftrightarrow{LM}$ is read as *line JK is parallel to line LM.*

## Real-World Example 1 Identify Parallel and Skew Relationships

Identify each of the following using the wedge of cheese below.

a. all segments parallel to $\overline{IP}$

$\overline{KQ}$ $\overline{LR}$




b. a segment skew to $\overline{KL}$

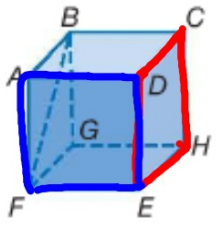
$\overline{JP}$ $\overline{PQ}$

c. a plane parallel to plane $PQR$

JKL

## GuidedPractice

**Identify each of the following using the cube shown.**

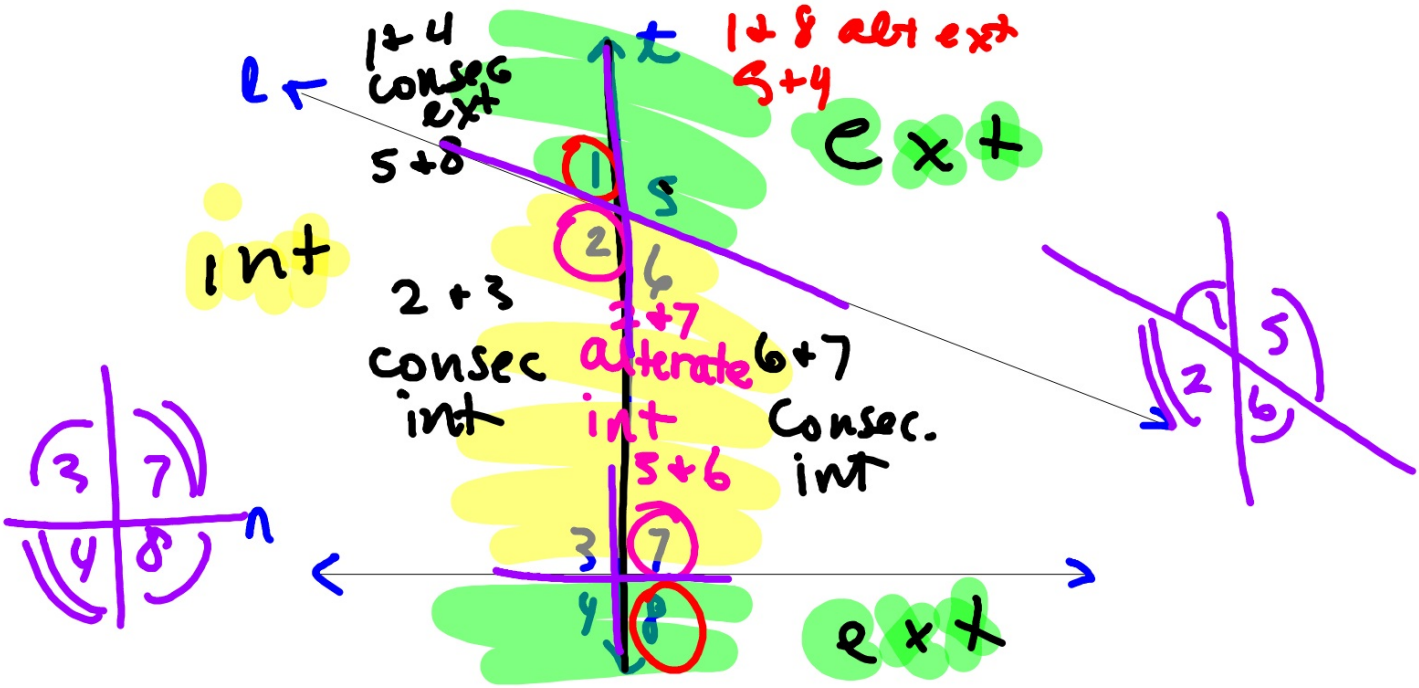



**1A.** all segments skew to $\overleftrightarrow{BC}$ $\overline{DE}$ $\overline{AE}$ $\overline{FG}$ $\overline{HE}$

**1B.** a segment parallel to $\overleftrightarrow{EH}$ $\overline{DC}$ $\overline{GF}$ $\overline{AB}$

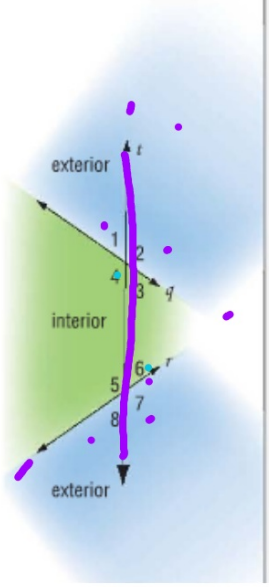
**1C.** all planes parallel to plane $DCH$

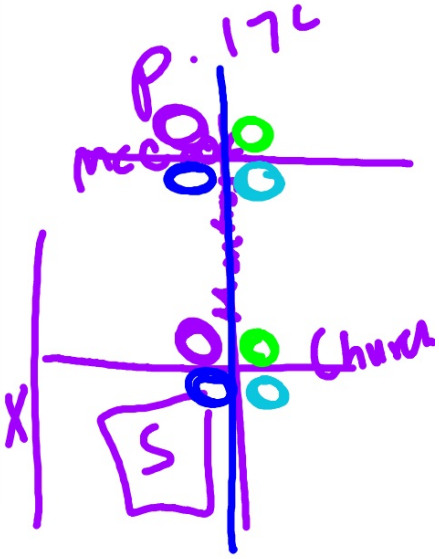
ABG

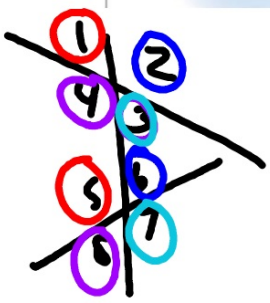

1+4
consec
ext
5+8
1+8 alt ext
3+4
ext
int
2+3
consec
int
3+7
alternate
int
5+6
6+7
Consec.
int
ext
l
t
m
1
2
3
4
5
6
7
8

**KeyConcept** Transversal Angle Pair Relationships

| | |
|---|---|
| Four **interior angles** lie in the region between lines $q$ and $r$. | $\angle 3, \angle 4, \angle 5, \angle 6$ |
| Four **exterior angles** lie in the two regions that are not between lines $q$ and $r$. | $\angle 1, \angle 2, \angle 7, \angle 8$ |
| **Consecutive interior angles** are interior angles that lie on the same side of transversal $t$. | $\angle 4$ and $\angle 5$, $\angle 3$ and $\angle 6$ |
| **Alternate interior angles** are nonadjacent interior angles that lie on opposite sides of transversal $t$. AIA | $\angle 3$ and $\angle 5$, $\angle 4$ and $\angle 6$ |
| **Alternate exterior angles** are nonadjacent exterior angles that lie on opposite sides of transversal $t$. AEA | $\angle 1$ and $\angle 7$, $\angle 2$ and $\angle 8$ |
| **Corresponding angles** lie on the same side of transversal $t$ and on the same side of lines $q$ and $r$. | $\angle 1$ and $\angle 5$, $\angle 2$ and $\angle 6$<br>$\angle 3$ and $\angle 7$, $\angle 4$ and $\angle 8$ |



**Example 3** Identify Transversals and Classify Angle Pai

Identify the transversal connecting each pair of angles in the photo. Then classify the relationship between each pair of angles.

alt ext AeA

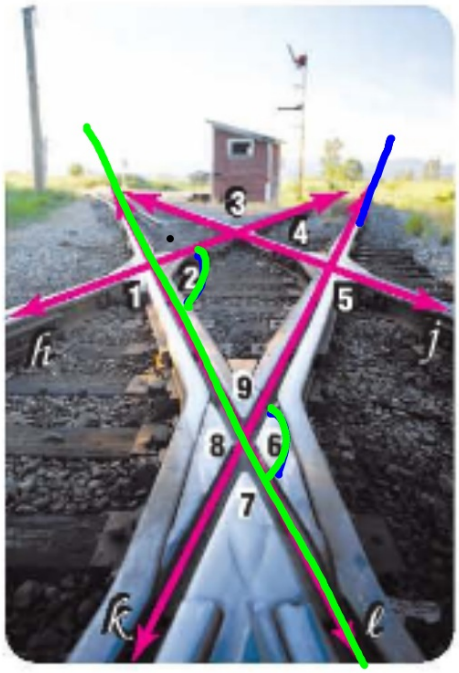
a. ∠1 and ∠3

b. ∠5 and ∠6

consec int CIA

c. ∠2 and ∠6

Corresp CA



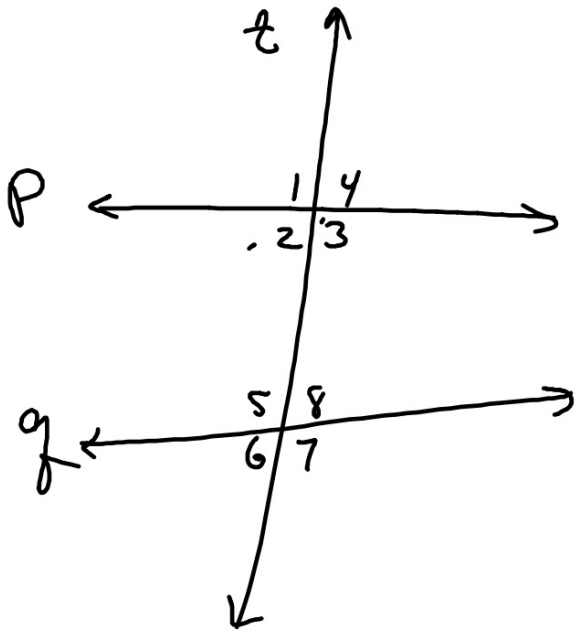

**Guided**Practice

**3A.** ∠3 and ∠5

**3B.** ∠2 and ∠8

**3C.** ∠5 and ∠7

**3D.** ∠2 and ∠9

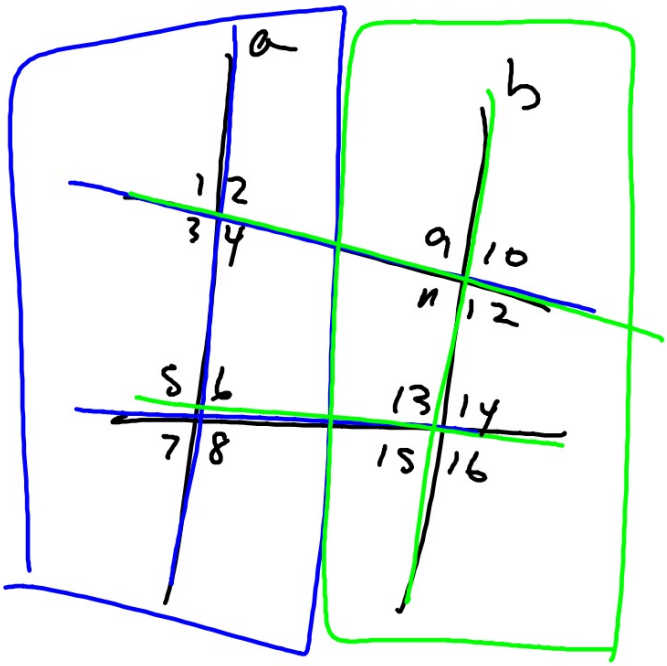



AIA: $\angle 2 \& \angle 8$
$\angle 3 \& \angle 5$

AeA: $\angle 1 \& \angle 7$
$\angle 4 \& \angle 6$

CA: $\angle 1 \& \angle 5$ $\angle 4 \& \angle 8$
$\angle 2 \& \angle 6$ $\angle 3 \& \angle 7$

CIA: $\angle 2 \& \angle 5$
$\angle 3 \& \angle 8$

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