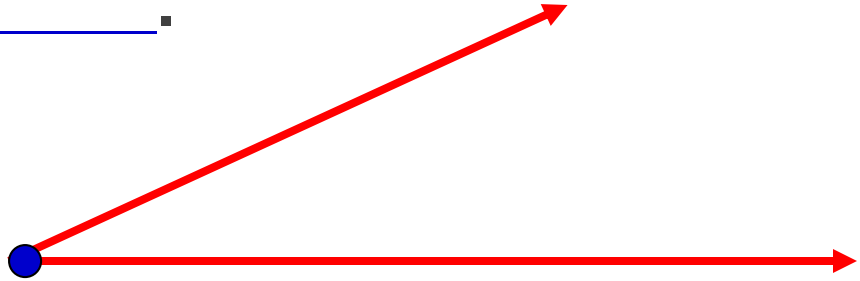
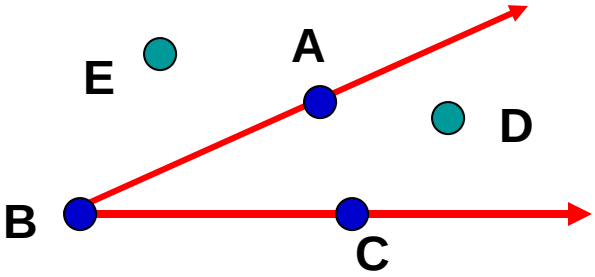
1.3 & 1.4

Angles, Measurement, & Angle Pairs

Angle and Points

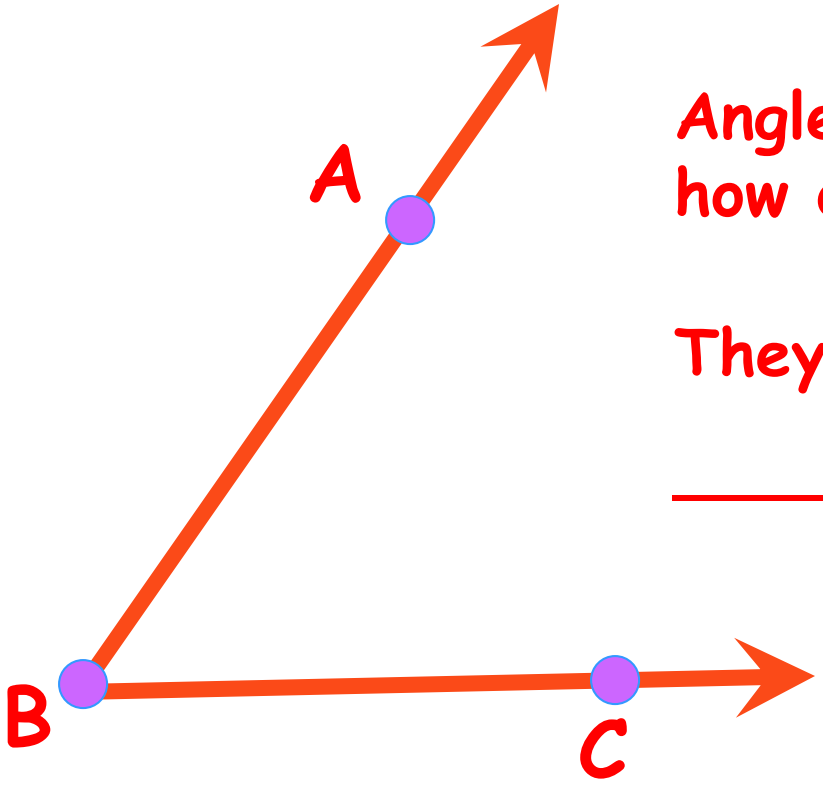
- An **angle** is a figure formed by two rays with a common endpoint, called the _____.





Points A, B and C are on the angle. D is in the _____ and E is in the _____ .

Measurement of Angles

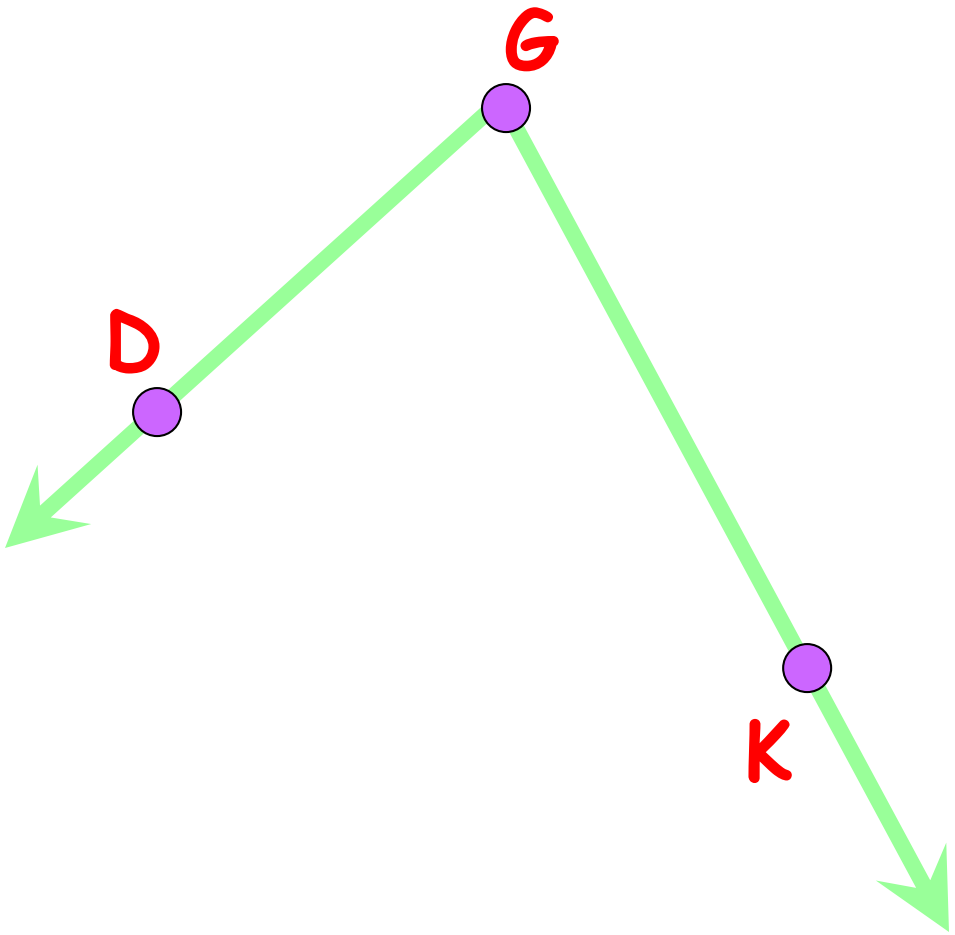


Angles are measured on how open they are.

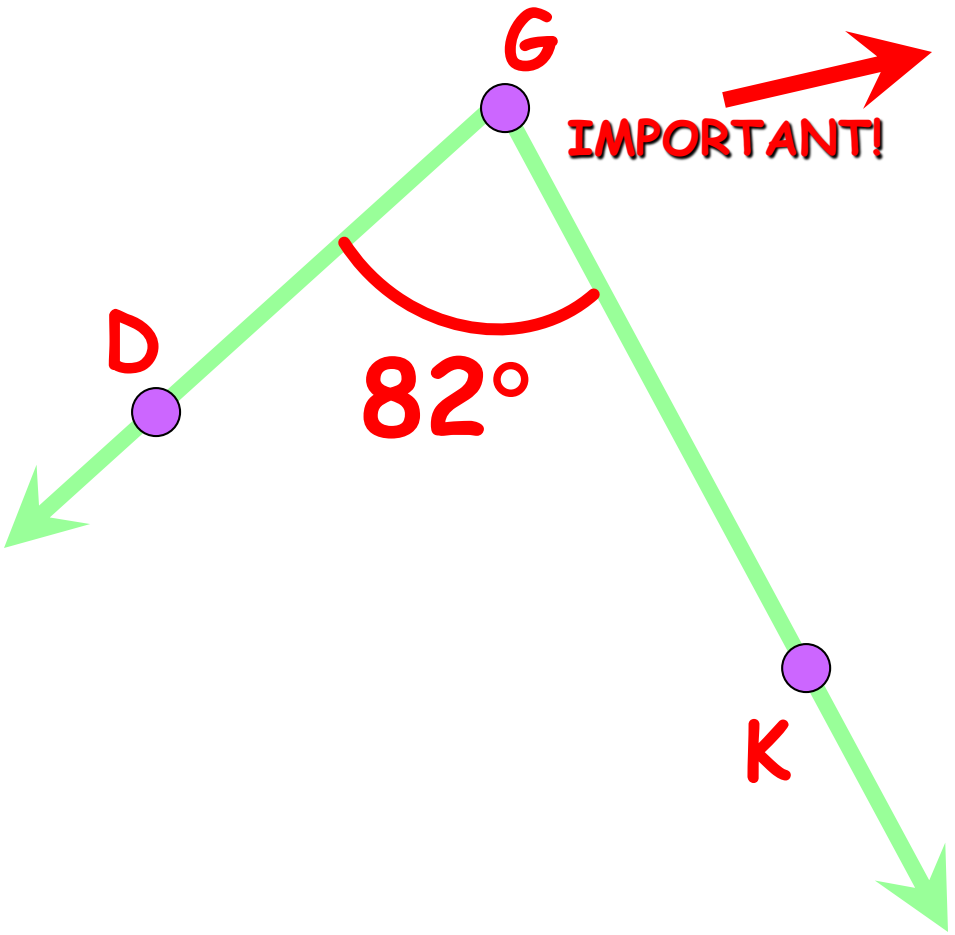
They're measured by

_____.

Naming an Angle



Naming the measurement of an angle



Terms to Know

Full Turn → 360°

Half Turn → 180°

$\frac{1}{4}$ Turn → 90°

1/8 Turn → 45°

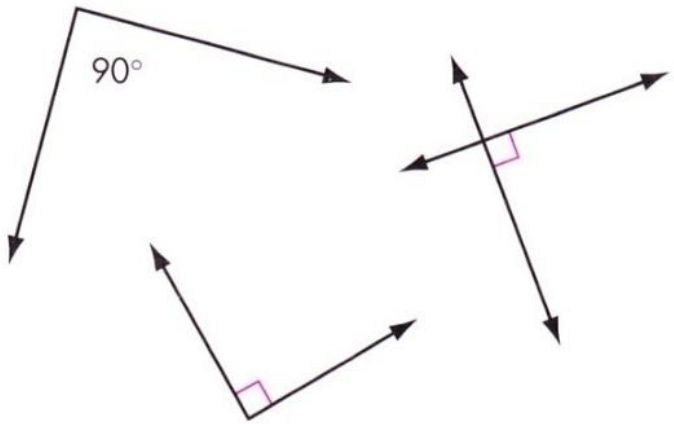
Writing your definitions

1) Precise
2) Avoid ambiguous terms (some, about, small…)
3) Make sure can't make a counterexample of the definition

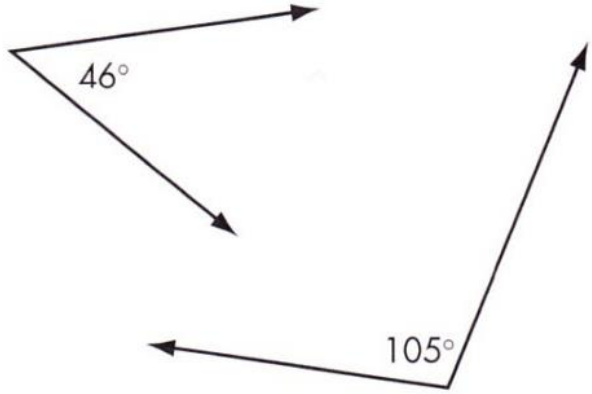
Defining...

1.* Define *right angle*.

Right angles



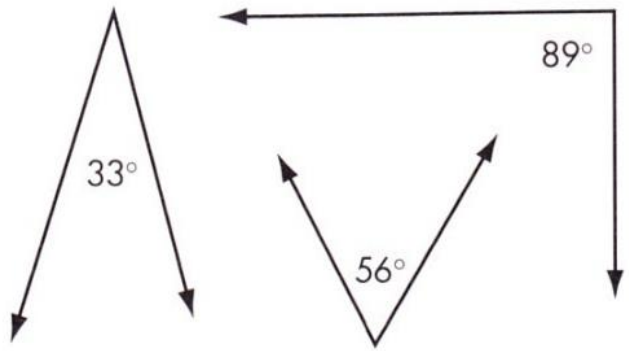
Not right angles



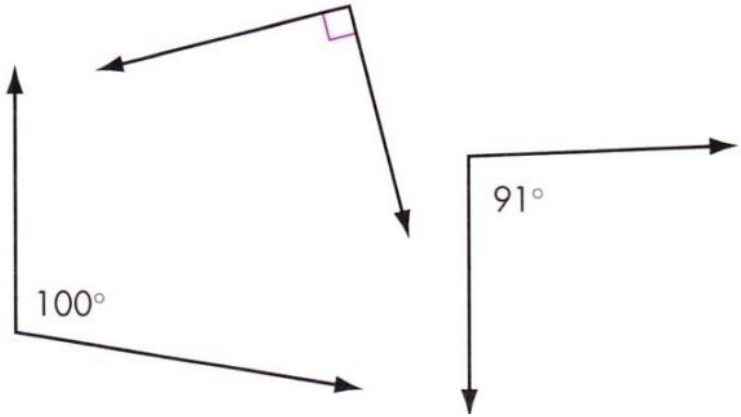
Defining...

2.* Define *acute angle*.

Acute angles



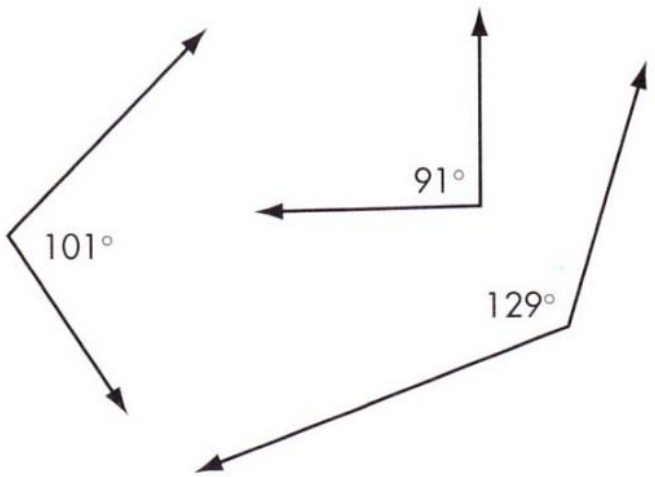
Not acute angles



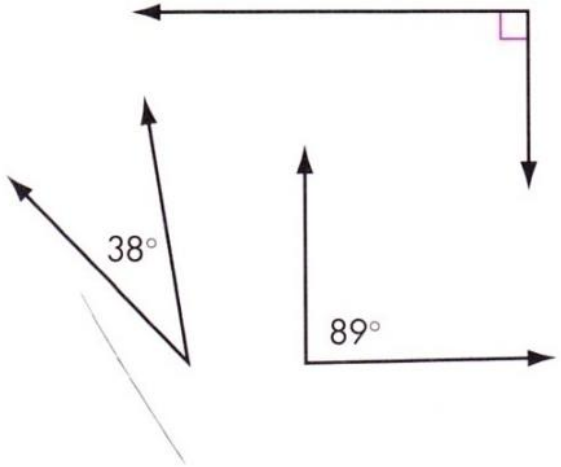
Defining...

3. Define *obtuse angle.*

Obtuse angles



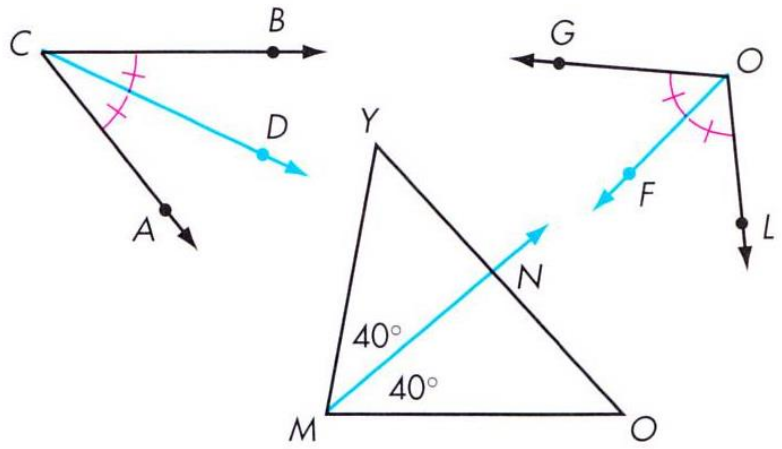
Not obtuse angles



Defining...

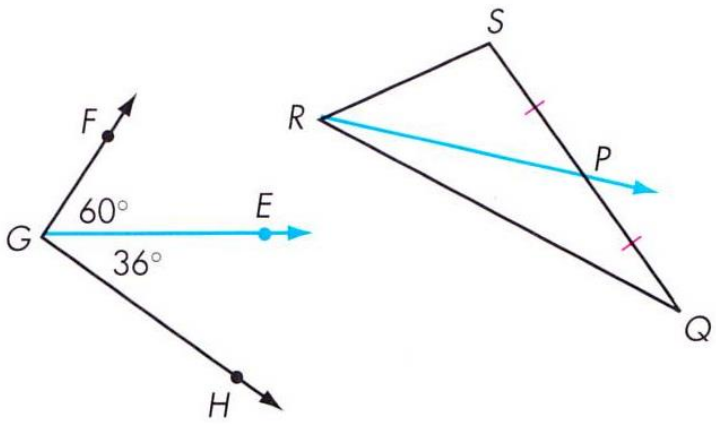
5. Define *angle bisector.*

Angle bisectors



Ray *CD*, ray *OF*, and ray *MN* are angle bisectors.

Not angle bisectors



Ray *GE* and ray *RP* are not angle bisectors.

Adding Angles

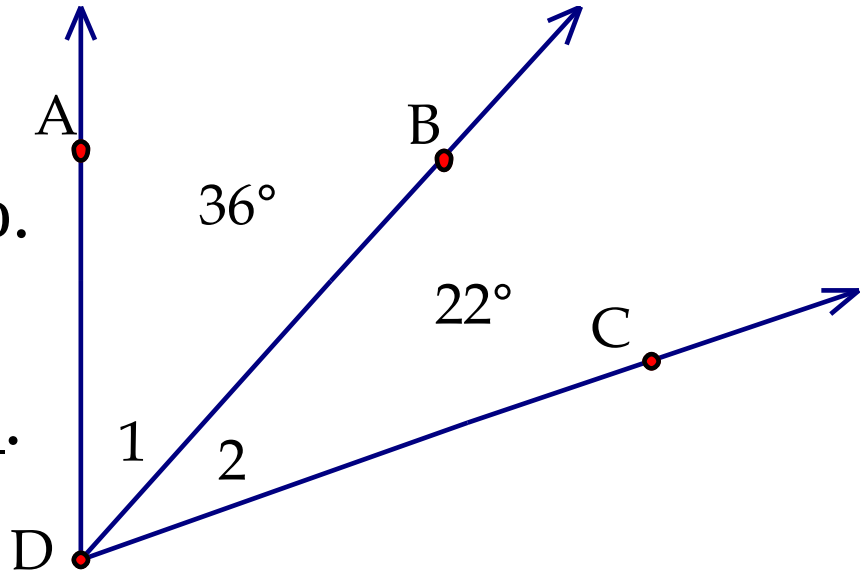
When you want to add angles, use the notation $m\angle 1$, meaning the measure of $\angle 1$.

If you add $m\angle 1 + m\angle 2$, what is your result?

_____.

$m\angle 1 + m\angle 2 =$ _____ also.

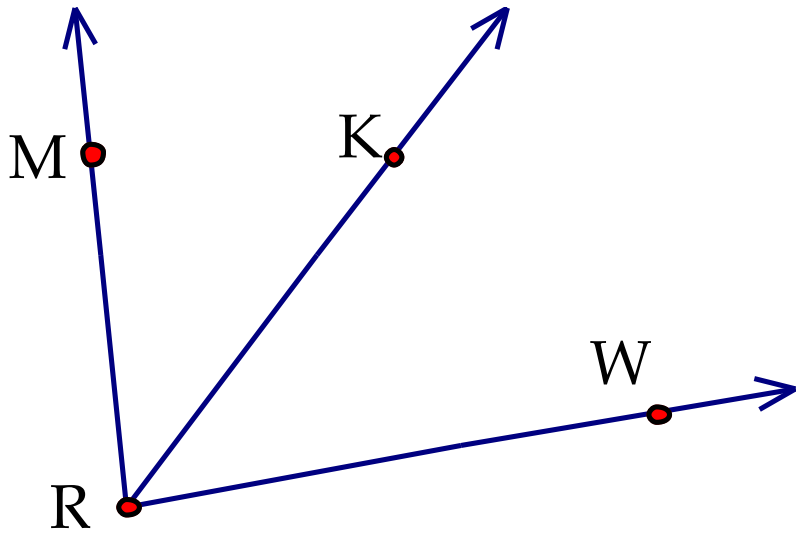
Therefore,_____.



Angle Addition Postulate

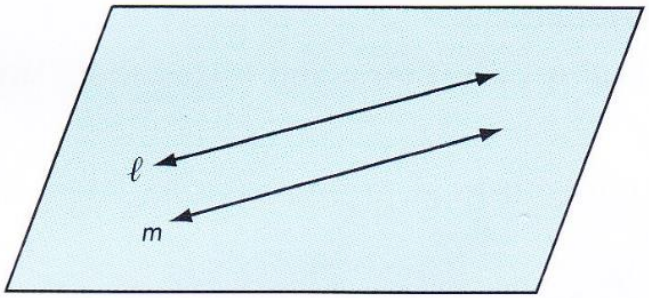
The _____ of the two _____ _____ will always equal the measure of the _____ _____.

m ∠ ____ + m ∠ ____ = m ∠ _____



1. Define *parallel lines.*

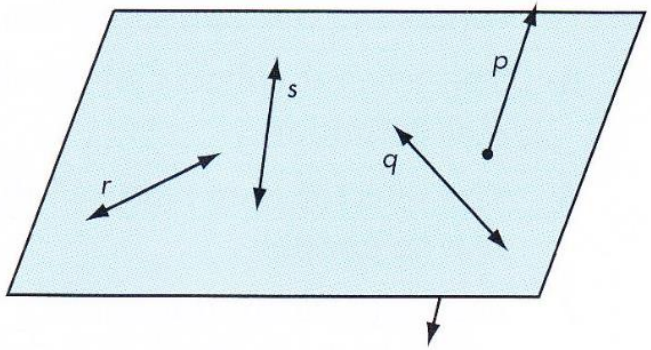
Parallel lines



$\ell \parallel m$

Note: Lines are sometimes labeled and named with lowercase letters. The symbol $\parallel$ means "is parallel to."

Not parallel lines

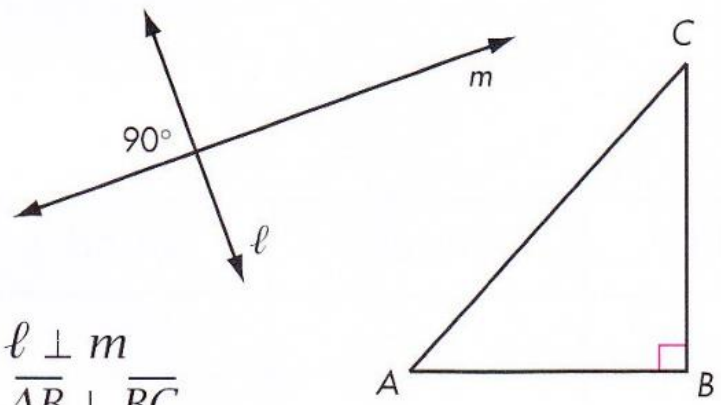


Line r is not parallel to line s.
Line p is not parallel to line q.
Note: Lines p and q are not in the same plane. Such lines are called **skew** lines.

SKEW LINES

2. Define *perpendicular lines.*

Perpendicular lines

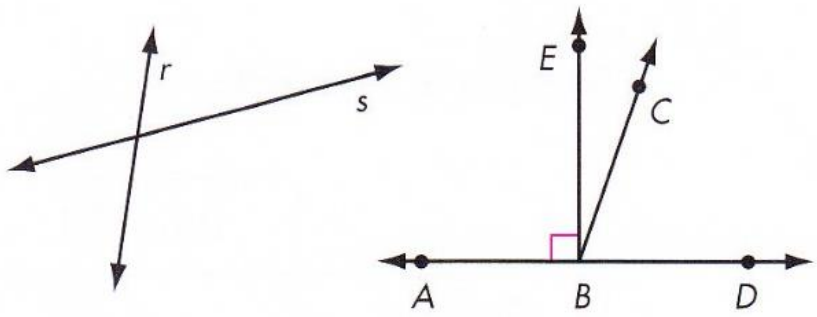


$\ell \perp m$

$\overline{AB} \perp \overline{BC}$

Note: The symbol $\perp$ means "is perpendicular to."

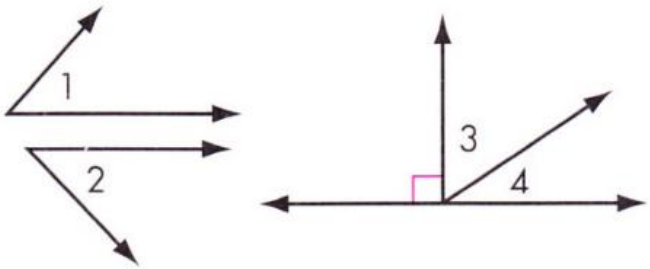
Not perpendicular lines



Line *r* is not perpendicular to line *s*.
Ray *BC* is not perpendicular to line *AD*.

3. Define *pair of complementary angles.*

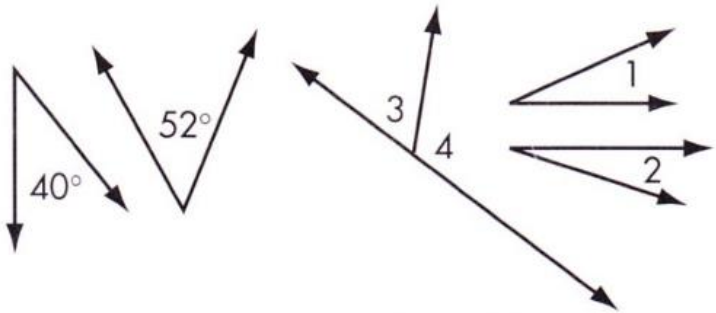
Pairs of complementary angles



$m\angle 1 + m\angle 2 = 90^\circ$

$m\angle 3 + m\angle 4 = 90^\circ$

Not pairs of complementary angles

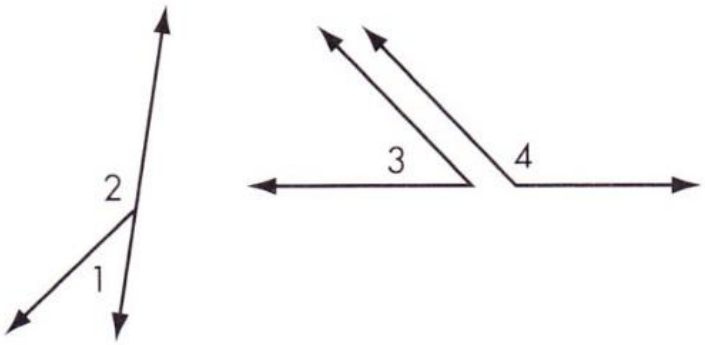


$m\angle 1 + m\angle 2 < 90^\circ$

Note: Sometimes it's convenient to name angles in a diagram with a number.

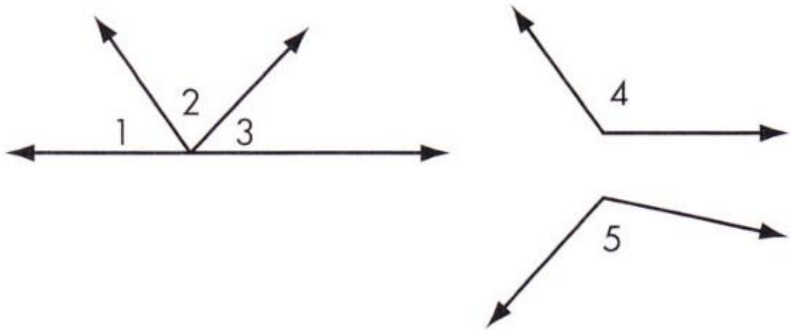
4. Define *pair of supplementary angles.*

Pairs of supplementary angles



$m\angle 1 + m\angle 2 = 180^\circ$
$m\angle 3 + m\angle 4 = 180^\circ$

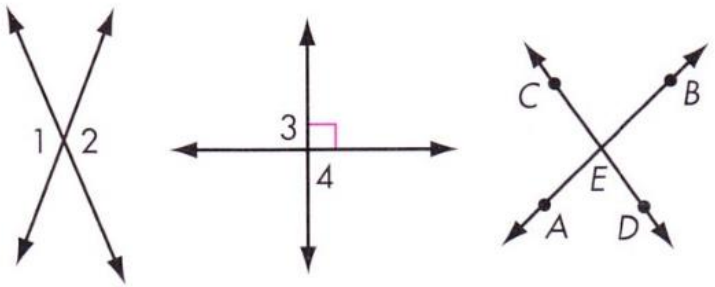
Not pairs of supplementary angles



$m\angle 1 + m\angle 2 < 180^\circ$
$m\angle 4 + m\angle 5 > 180^\circ$

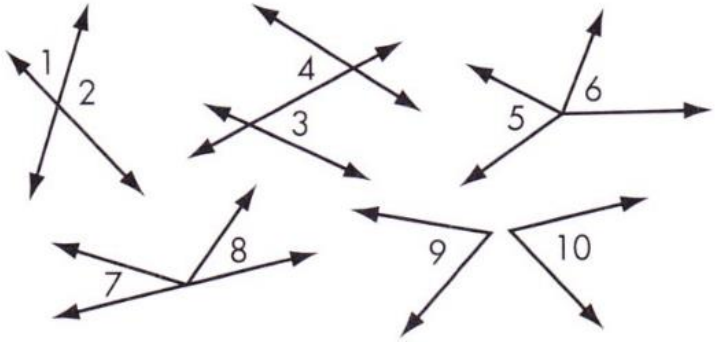
5.* Define *pair of vertical angles.*

Pairs of vertical angles



$\angle 1$ and $\angle 2$ are a pair of vertical angles.
$\angle 3$ and $\angle 4$ are also vertical angles.
$\angle AED$ and $\angle BEC$ are also vertical angles.

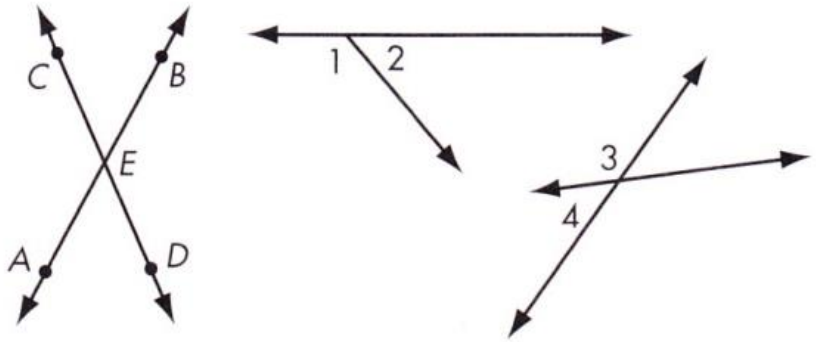
Not pairs of vertical angles



$\angle 1$ and $\angle 2$, $\angle 3$ and $\angle 4$, $\angle 5$ and $\angle 6$, $\angle 7$ and $\angle 8$, and $\angle 9$ and $\angle 10$ are not pairs of vertical angles.

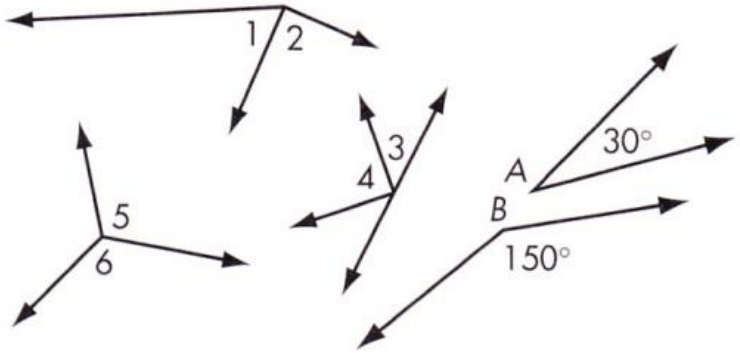
6.* Define *linear pair of angles.*

Linear pairs of angles



$\angle 1$ and $\angle 2$ are a linear pair of angles.
$\angle 3$ and $\angle 4$ are a linear pair of angles.
$\angle AED$ and $\angle AEC$ are a linear pair of angles.

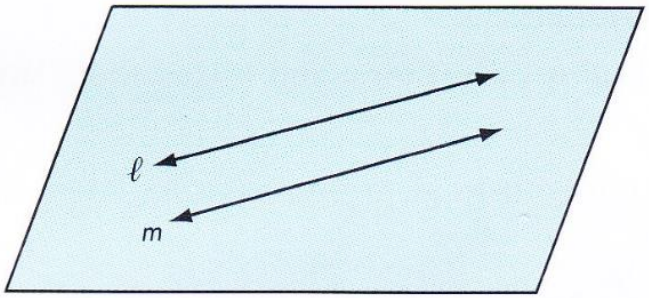
Not linear pairs of angles



$\angle 1$ and $\angle 2$, $\angle 3$ and $\angle 4$, $\angle 5$ and $\angle 6$, and $\angle A$ and $\angle B$ are not linear pairs of angles.

1. Define *parallel lines.*

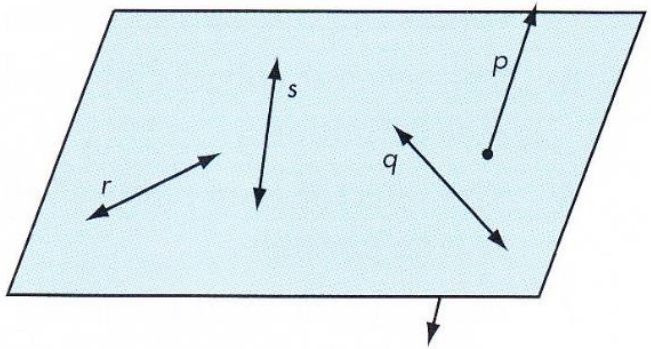
Parallel lines



$\ell \parallel m$

Note: Lines are sometimes labeled and named with lowercase letters. The symbol $\parallel$ means "is parallel to."

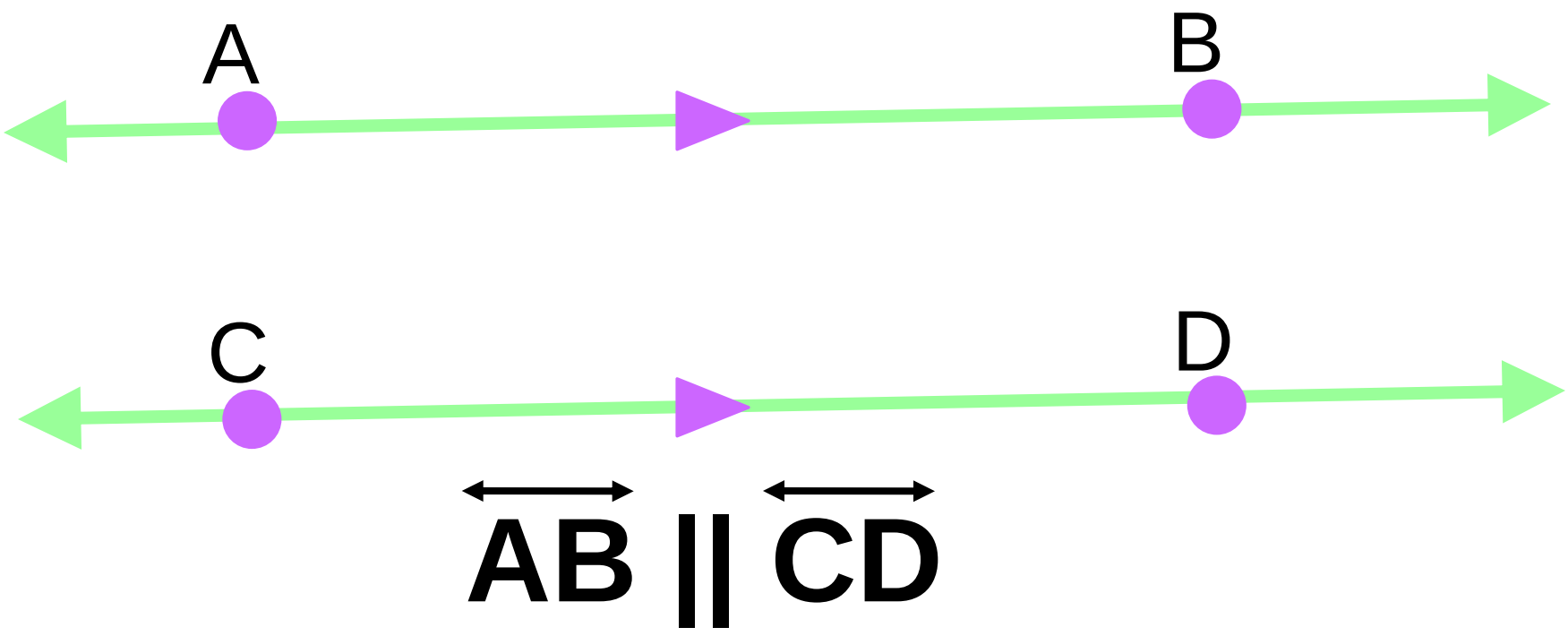
Not parallel lines



Line r is not parallel to line s.
Line p is not parallel to line q.
Note: Lines p and q are not in the same plane. Such lines are called **skew** lines.

Start over

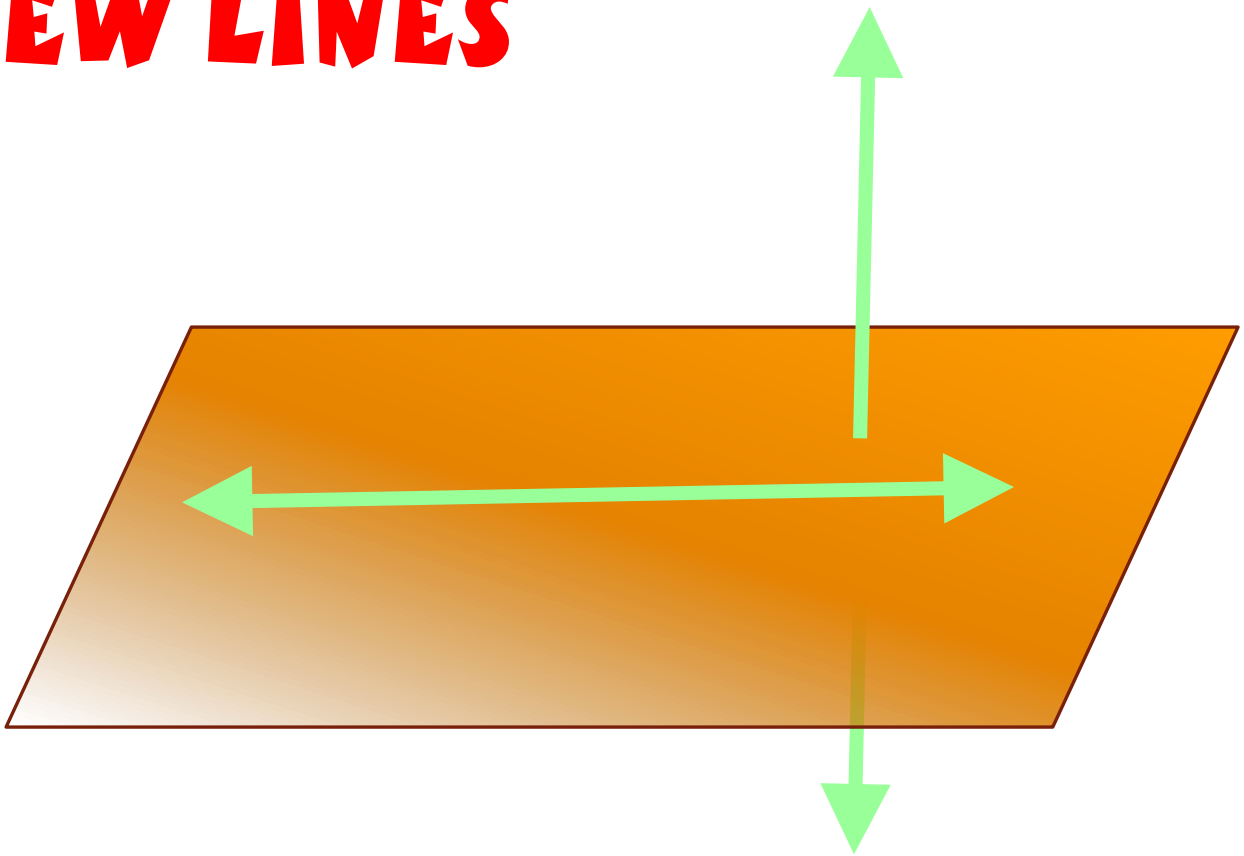
PARALLEL LINES



$\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$

Lines that never touch and are on the same plane

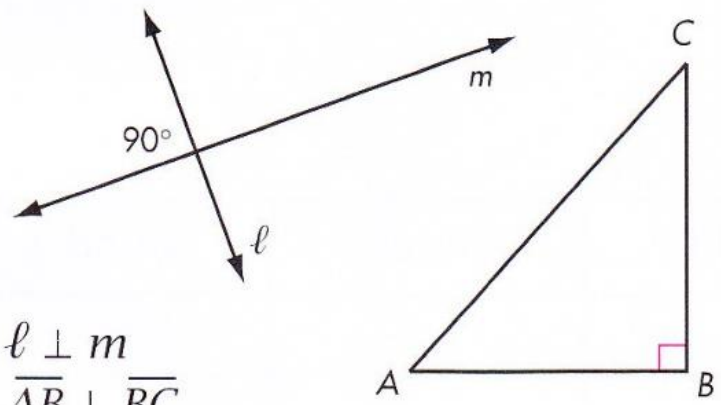
SKEW LINES



Lines that never touch and are on different planes

2. Define *perpendicular lines.*

Perpendicular lines

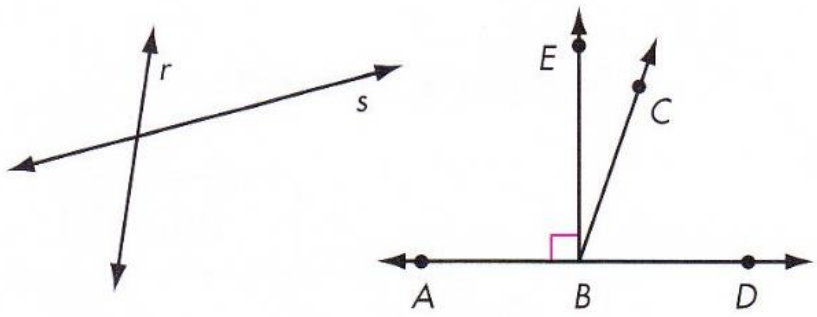


$\ell \perp m$

$\overline{AB} \perp \overline{BC}$

Note: The symbol $\perp$ means "is perpendicular to."

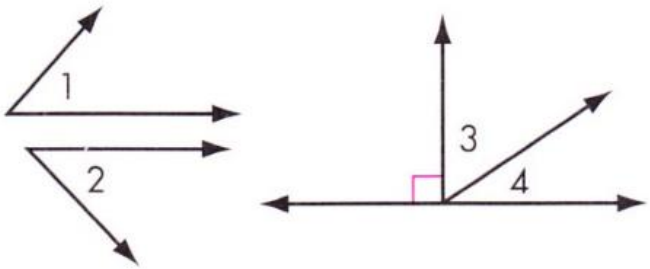
Not perpendicular lines



Line *r* is not perpendicular to line *s*.
Ray *BC* is not perpendicular to line *AD*.

3. Define *pair of complementary angles.*

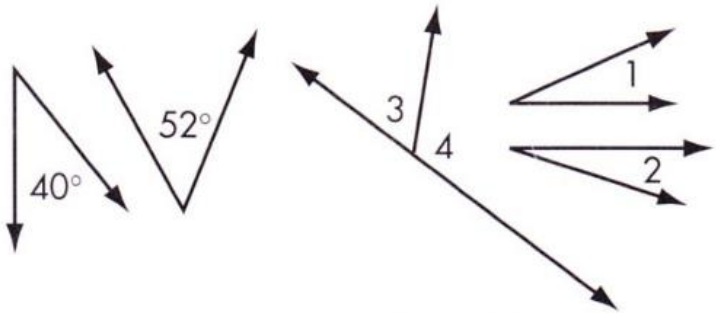
Pairs of complementary angles



$m\angle 1 + m\angle 2 = 90^\circ$

$m\angle 3 + m\angle 4 = 90^\circ$

Not pairs of complementary angles

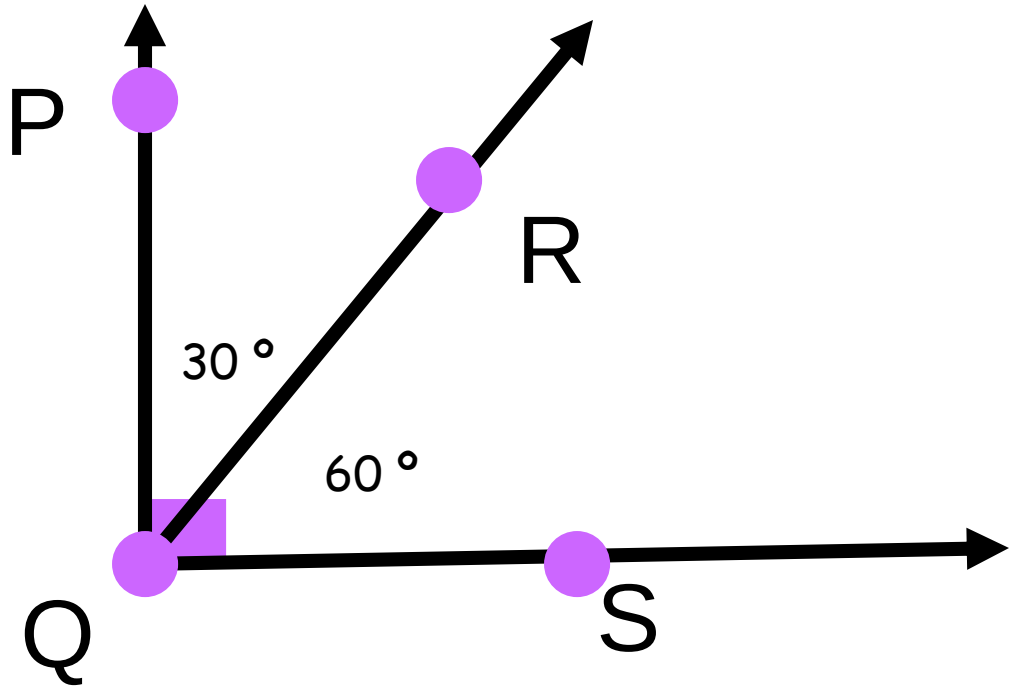


$m\angle 1 + m\angle 2 < 90^\circ$

Note: Sometimes it's convenient to name angles in a diagram with a number.

COMPLEMENTARY ANGLES

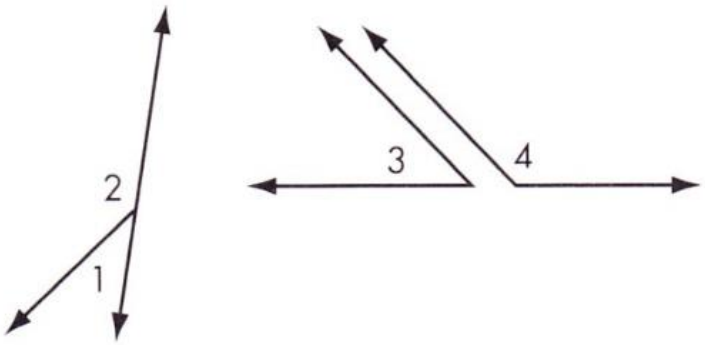
∠PQR and ∠RQS
are complementary



Two angles whose sum equals 90°

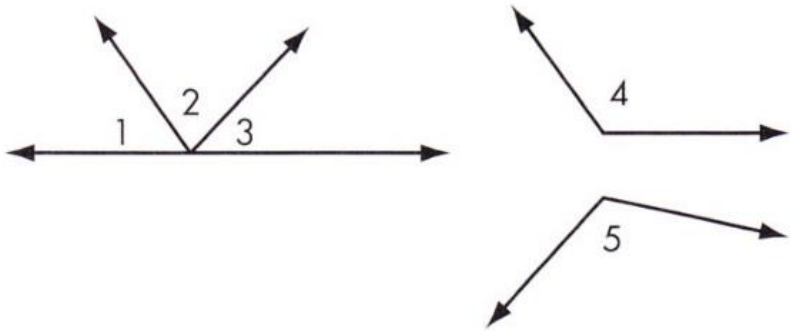
4. Define *pair of supplementary angles.*

Pairs of supplementary angles



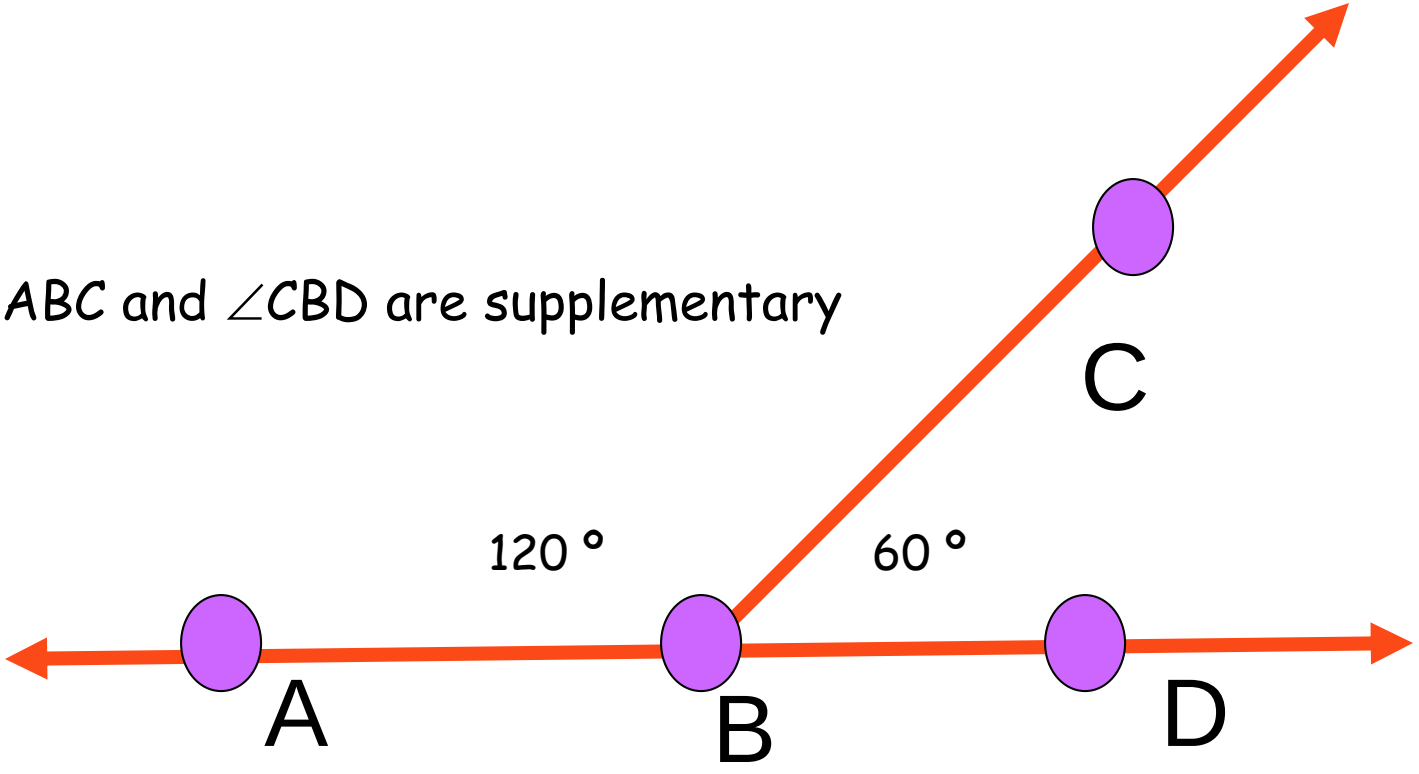
$m\angle 1 + m\angle 2 = 180^\circ$
$m\angle 3 + m\angle 4 = 180^\circ$

Not pairs of supplementary angles



$m\angle 1 + m\angle 2 < 180^\circ$
$m\angle 4 + m\angle 5 > 180^\circ$

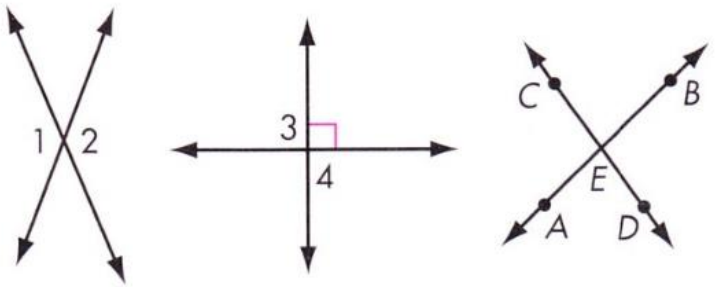
SUPPLEMENTARY ANGLES



Two angles (that don't necessarily have to be adjacent) whose sum equals 180°

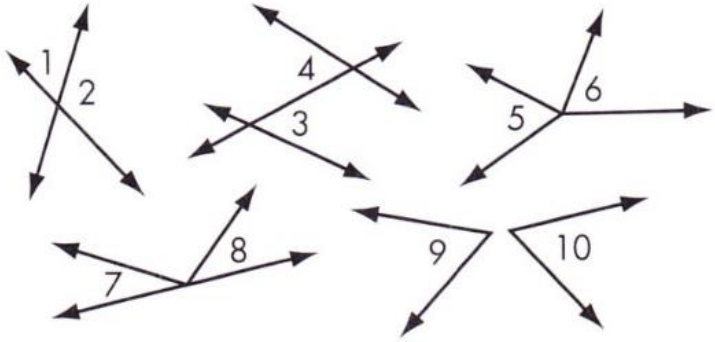
5.* Define *pair of vertical angles.*

Pairs of vertical angles



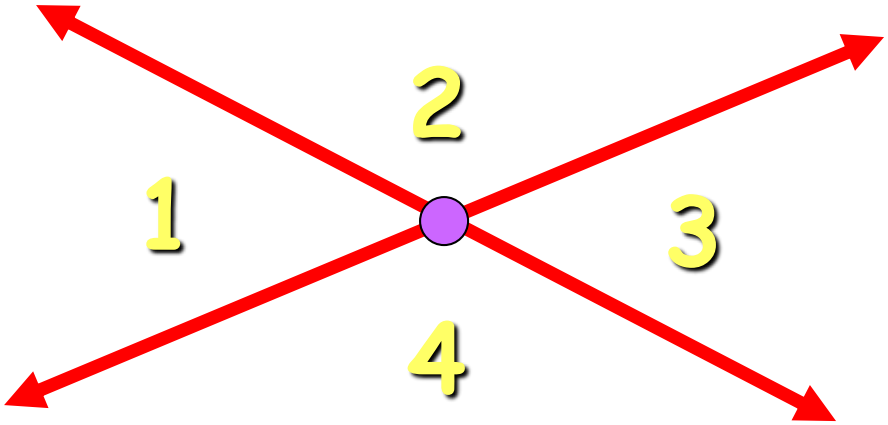
$\angle 1$ and $\angle 2$ are a pair of vertical angles.
$\angle 3$ and $\angle 4$ are also vertical angles.
$\angle AED$ and $\angle BEC$ are also vertical angles.

Not pairs of vertical angles



$\angle 1$ and $\angle 2$, $\angle 3$ and $\angle 4$, $\angle 5$ and $\angle 6$, $\angle 7$ and $\angle 8$, and $\angle 9$ and $\angle 10$ are not pairs of vertical angles.

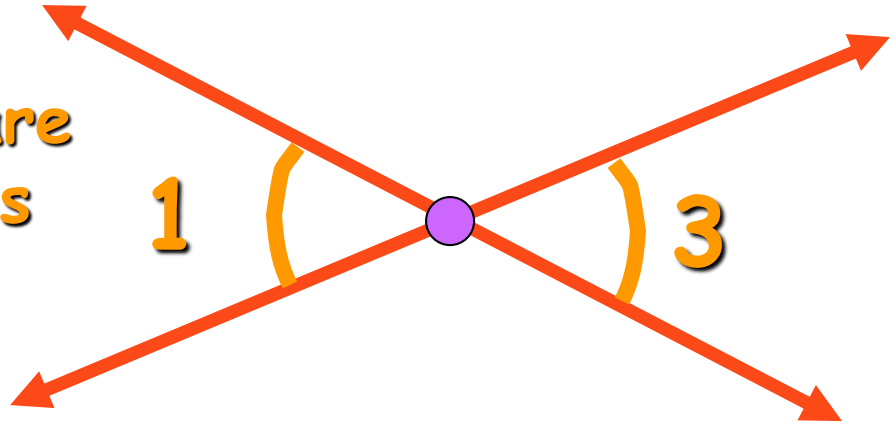
VERTICAL ANGLES



Vertical angles are opposite sides from the vertex when two lines intersect. They are congruent.

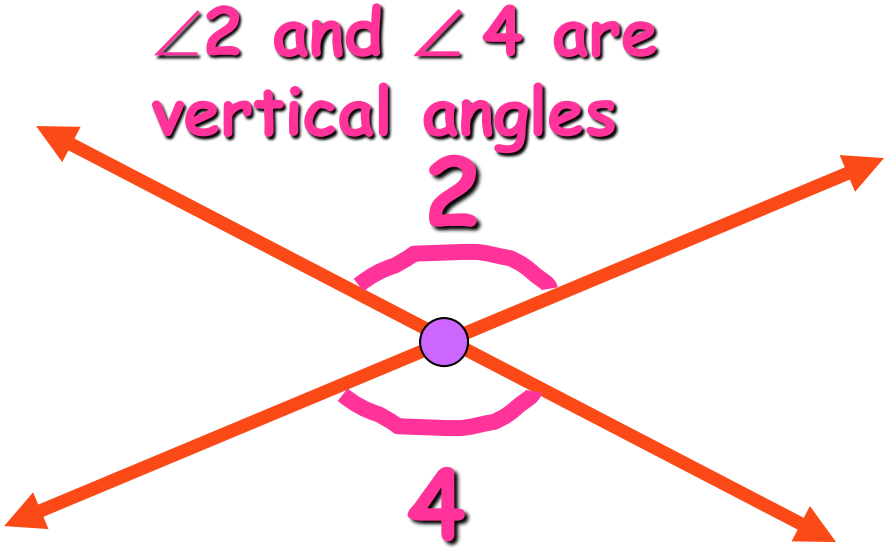
VERTICAL ANGLES

∠1 and ∠3 are vertical angles



Vertical angles are opposite sides from the vertex when two lines intersect. They are congruent.

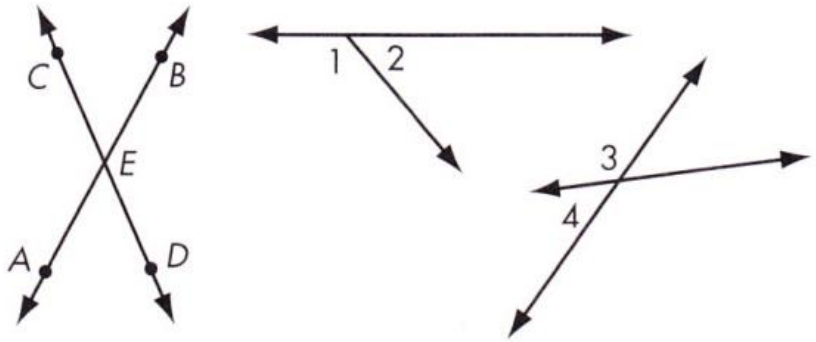
VERTICAL ANGLES



Vertical angles are opposite sides from the vertex when two lines intersect. They are congruent.

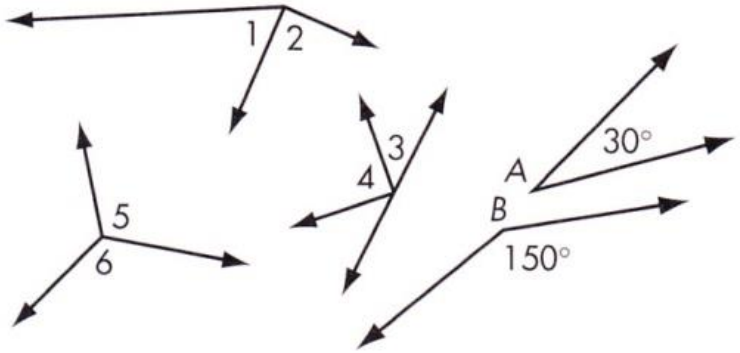
6.* Define *linear pair of angles.*

Linear pairs of angles



$\angle 1$ and $\angle 2$ are a linear pair of angles.
$\angle 3$ and $\angle 4$ are a linear pair of angles.
$\angle AED$ and $\angle AEC$ are a linear pair of angles.

Not linear pairs of angles



$\angle 1$ and $\angle 2$, $\angle 3$ and $\angle 4$, $\angle 5$ and $\angle 6$, and $\angle A$ and $\angle B$ are not linear pairs of angles.

Definitions

Definitions

Point	An undefined term ,no size, only location, and 0-D.
Line	
Plane	
Line Segment	
Ray	
Collinear	