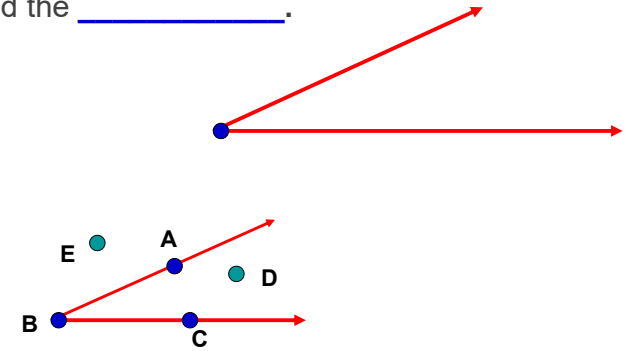# 1.3 & 1.4

ANGLES, MEASUREMENT, & ANGLE PAIRS
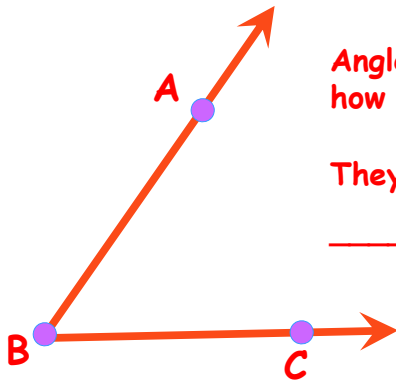

Angle and Points

2

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

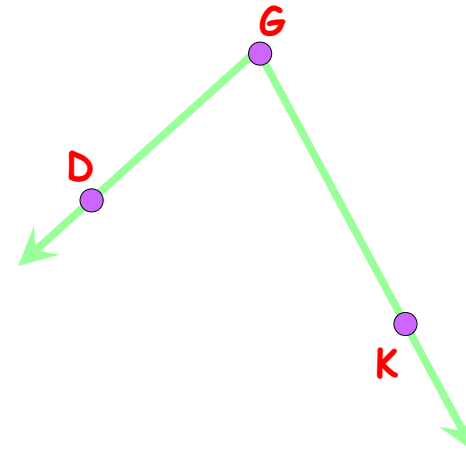**Points A, B and C are on the angle. D is in the _____ and E is in the _____ .**
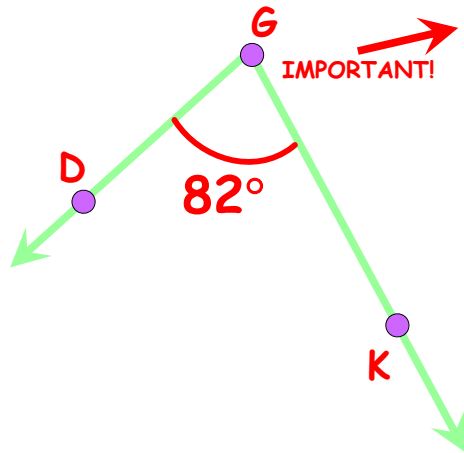

Measurement of Angles

Angles are measured on how open they are.

They're measured by _____.

Naming an Angle

Naming the measurement of an angle

G

IMPORTANT!

D

82°

K

Terms to Know

Full Turn → 360°
Half Turn → 180°
¼ Turn → 90°
1/8 Turn → 45°

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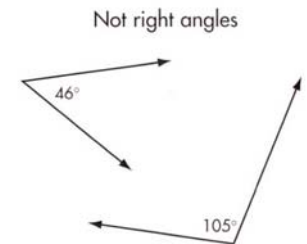
1) Precise
2) Avoid ambiguous terms (some, about, small...)
3) Make sure can't make a counterexample of the definition
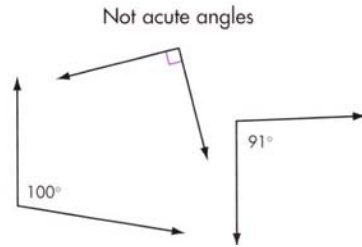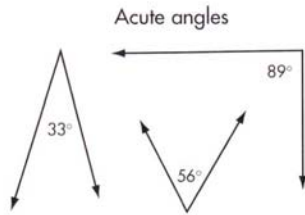
Defining...

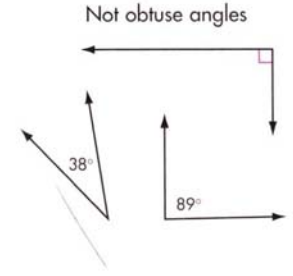1.* Define *right angle*.
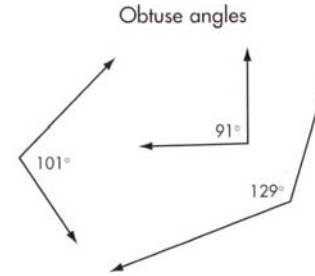

Right angles

90°

Not right angles

46°

105°
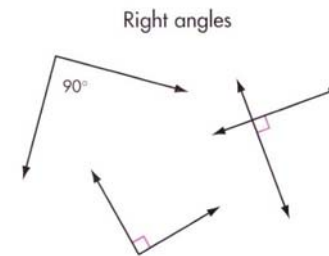
Defining...

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

Not angle bisectors
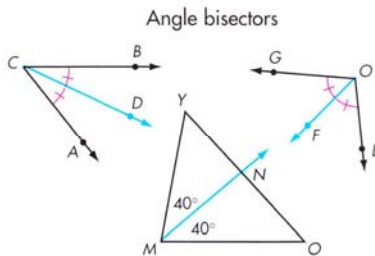
Ray *CD*, ray *OF*, and ray *MN* are angle bisectors.
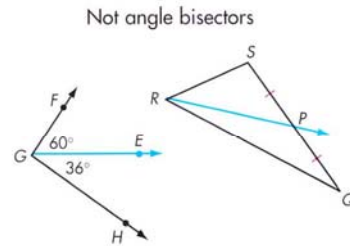
Ray *GE* and ray *RP* are not angle bisectors.

Adding Angles

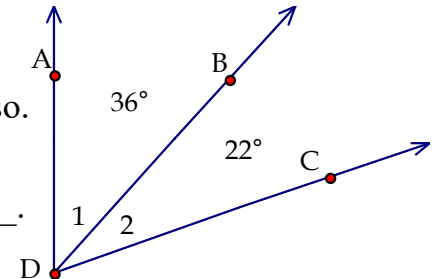When you want to add angles, use the notation m∠1, meaning the measure of ∠1.

If you add m∠1 + m∠2, what is your result?

_____.

m∠1 + m∠2 = _____ also.

Therefore,_____.

Angle Addition Postulate

The _____ of the two _____ _____ will always equal the measure of the _____ _____.
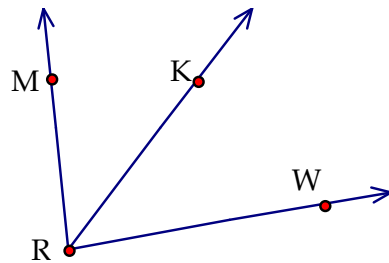
$$m\angle \text{\_\_\_\_} + m\angle \text{\_\_\_\_} = m\angle \text{\_\_\_\_}$$
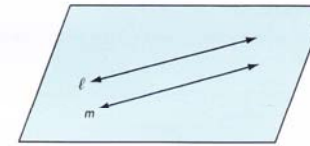
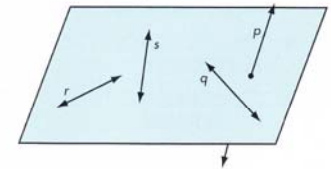Define *parallel lines*.

Parallel lines	Not parallel lines

$\ell \parallel m$

Note: Lines are sometimes labeled and named with lowercase letters. The symbol $\parallel$ means "is parallel to."
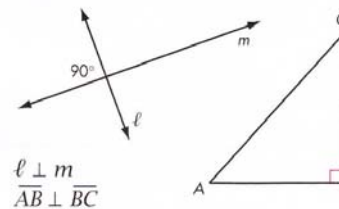
Line *r* is not parallel to line *s*.
Line *p* is not parallel to line *q*.
Note: Lines *p* and *q* are not in the same plane. Such lines are called **skew** lines.

SKEW LINES

2. Define *perpendicular lines*.
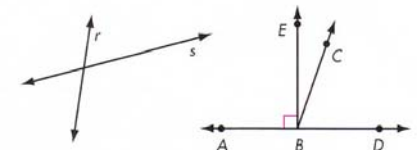
Perpendicular lines	Not perpendicular lines

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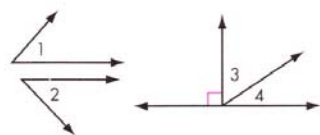$\overline{AB} \perp \overline{BC}$

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

Line *r* is not perpendicular to line *s*.
Ray *BC* is not perpendicular to line *AD*.
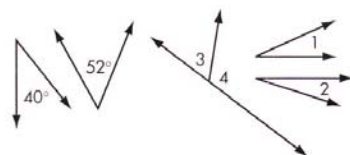
3. Define *pair of complementary angles.*

Pairs of complementary angles Not pairs of complementary angles

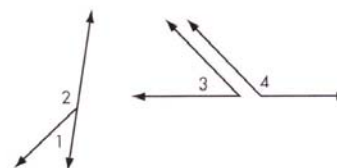$m\angle 1 + m\angle 2 = 90°$
$m\angle 3 + m\angle 4 = 90°$ $m\angle 1 + m\angle 2 < 90°$

Note: Sometimes it's convenient to name angles in a diagram with a number.
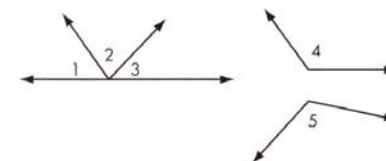
4. Define *pair of supplementary angles.*

Pairs of supplementary angles Not pairs of supplementary angles

$m\angle 1 + m\angle 2 = 180°$
$m\angle 3 + m\angle 4 = 180°$ $m\angle 1 + m\angle 2 < 180°$
$m\angle 4 + m\angle 5 > 180°$

5.* Define *pair of vertical angles.*
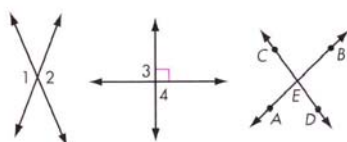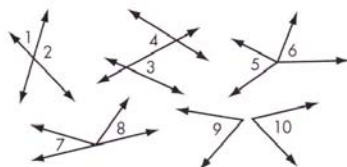
Pairs of vertical angles Not pairs of vertical angles

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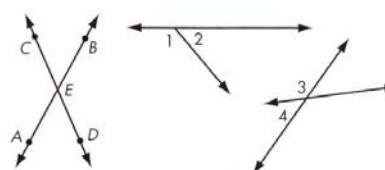$\angle AED$ and $\angle BEC$ are also vertical angles. $\angle 1$ and $\angle 2$, $\angle 3$ and $\angle 4$, $\angle 5$ and $\angle 6$, $\angle 7$ and $\angle 8$, and $\angle 9$ and $\angle 10$ are not pairs of vertical angles.

6.* Define *linear pair of angles.*

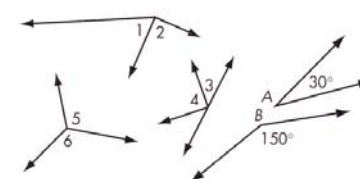Linear pairs of angles Not linear pairs of angles

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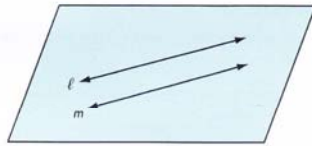$\angle AED$ and $\angle AEC$ are a linear pair of angles. $\angle 1$ and $\angle 2$, $\angle 3$ and $\angle 4$, $\angle 5$ and $\angle 6$, and $\angle A$ and $\angle B$ are not linear pairs of angles.

Top-left panel

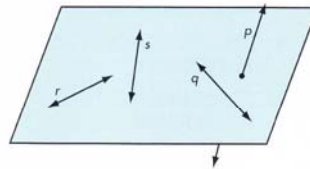1. Define *parallel lines*.

Parallel lines	Not parallel lines

$\ell \parallel m$

Note: Lines are sometimes labeled and named with lowercase letters. The symbol $\parallel$ means "is parallel to."
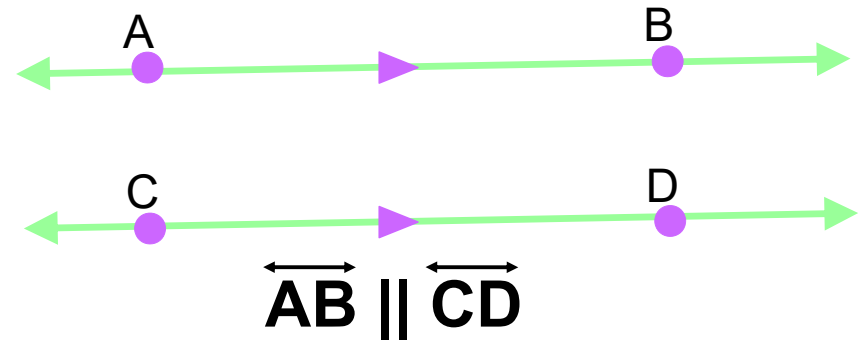
Line *r* is not parallel to line *s*.
Line *p* is not parallel to line *q*.
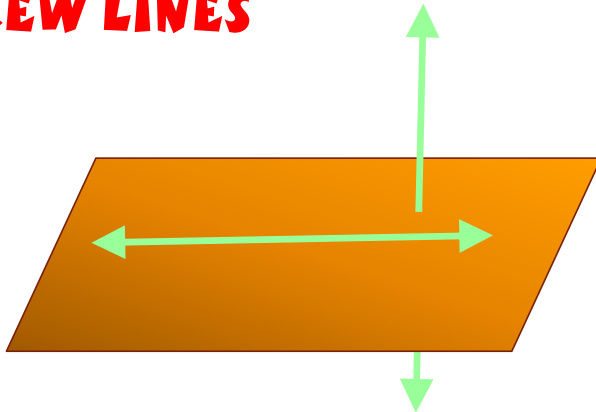Note: Lines *p* and *q* are not in the same plane. Such lines are called **skew** lines.

Top-right panel

PARALLEL LINES

A   B

C   D

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

Lines that never touch and are on the same plane

Bottom-left panel

SKEW LINES

Lines that never touch and are on different planes
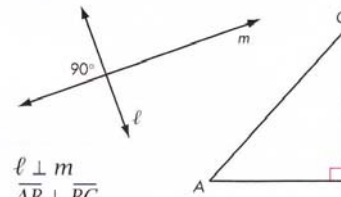
Bottom-right panel

2. Define *perpendicular lines*.

Perpendicular lines	Not perpendicular lines

90°

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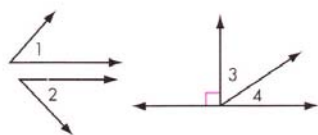$\overline{AB} \perp \overline{BC}$

Note: The symbol $\perp$ means "is perpendicular to."
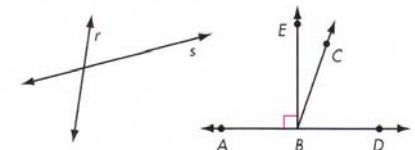
Line *r* is not perpendicular to line *s*.
Ray *BC* is not perpendicular to line *AD*.
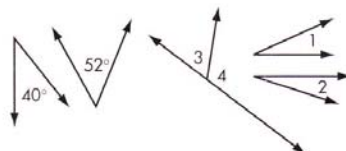
3. Define *pair of complementary angles.*

Pairs of complementary angles

Not pairs of complementary angles

$m\angle 1 + m\angle 2 = 90°$
$m\angle 3 + m\angle 4 = 90°$
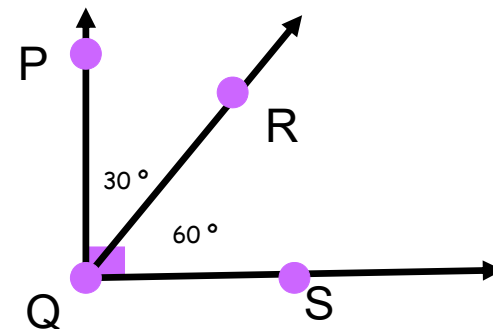
$m\angle 1 + m\angle 2 < 90°$

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

COMPLEMENTARY ANGLES

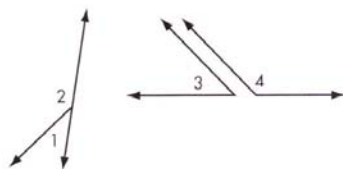∠PQR and ∠RQS
are complementary

30 °

60 °

Two angles whose sum equals 90°

4. Define *pair of supplementary angles.*

Pairs of supplementary angles

Not pairs of supplementary angles
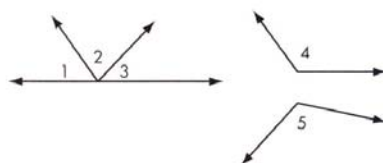
$m\angle 1 + m\angle 2 = 180°$
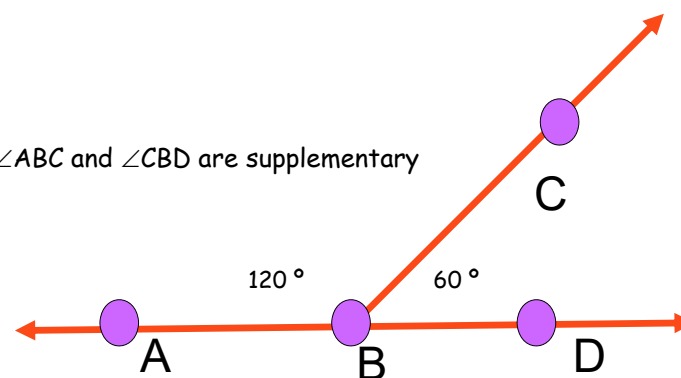$m\angle 3 + m\angle 4 = 180°$

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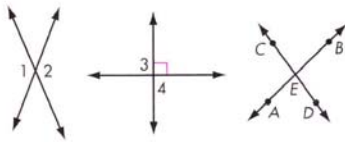$m\angle 4 + m\angle 5 > 180°$

SUPPLEMENTARY ANGLES

∠ABC and ∠CBD are supplementary

120 °

60 °

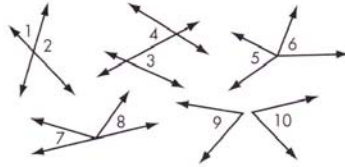**Two angles (that don't necessarily have to be adjacent) whose sum equals 180°**

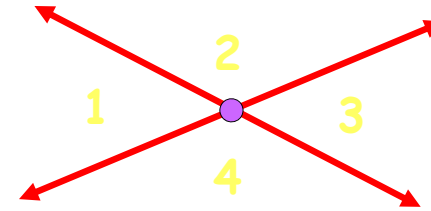**5.** Define *pair of vertical angles.*

Pairs of vertical angles

Not pairs of vertical angles

∠1 and ∠2 are a pair of vertical angles.
∠3 and ∠4 are also vertical angles.
∠AED and ∠BEC are also vertical angles.

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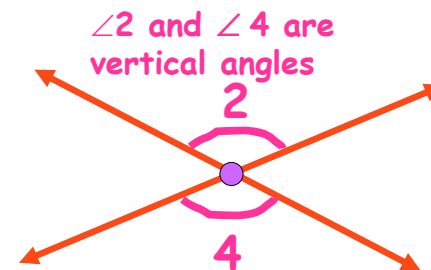of vertical angles.

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.
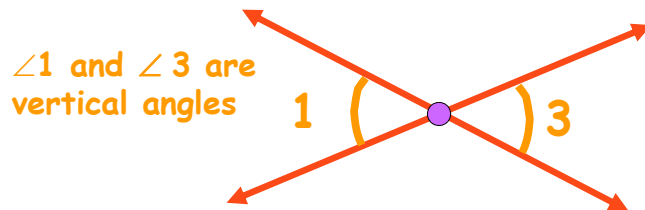
VERTICAL ANGLES

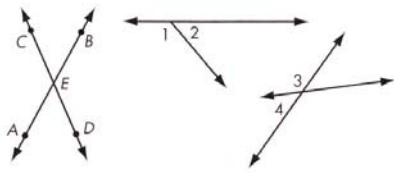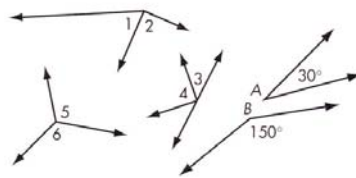∠2 and ∠4 are vertical angles

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

Not linear pairs of angles

∠1 and ∠2 are a linear pair of angles.
∠3 and ∠4 are a linear pair of angles.
∠AED and ∠AEC are a linear pair of angles.

∠1 and ∠2, ∠3 and ∠4, ∠5 and ∠6, and
∠A and ∠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	