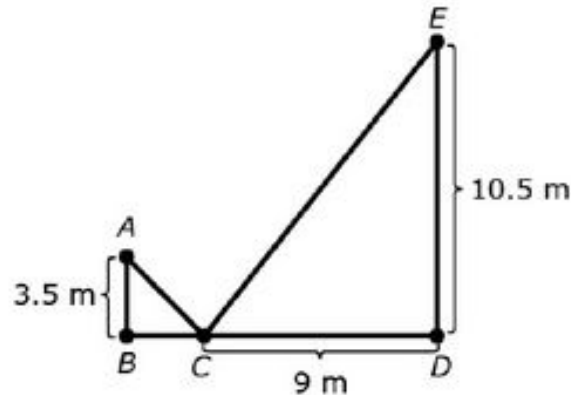# Warm-Up

Turn in test corrections

Turn in signed report cards (Homeroom)

1. Determine whether each statement is true or false? *Circle true or false.*

   **A.** Two triangles are similar if one triangle can be mapped onto the other through a sequence of transformations, including dilations.

   True    False

   **B.** Two triangles are similar if two pairs of corresponding angles are equal.

   True    False

   **C.** Two triangles are similar if they share a common vertex.

   True    False

2. In this figure, $\triangle ABC$ is similar to $\triangle EDC$.



What is the length, in meters, of $\overline{BC}$ ? _____

# Warm-Up

**1.** Determine whether each statement is true or false? *Circle true or false.*

**A.** Two triangles are similar if one triangle can be mapped onto the other through a sequence of transformations, including dilations.

(True)　　　False

**B.** Two triangles are similar if two pairs of corresponding angles are equal.

(True)　　　False

**C.** Two triangles are similar if they share a common vertex.

True　　　(False)

**2.** In this figure, △ABC is similar to △EDC.

$$\frac{AB}{BC} = \frac{ED}{DC}$$

$$\frac{3.5}{x} \overset{\times 3}{=} \frac{10.5}{9}$$

$$\div 3, \quad 9$$

$$\boxed{x = 3}$$

3.5 m

10.5 m

9 m
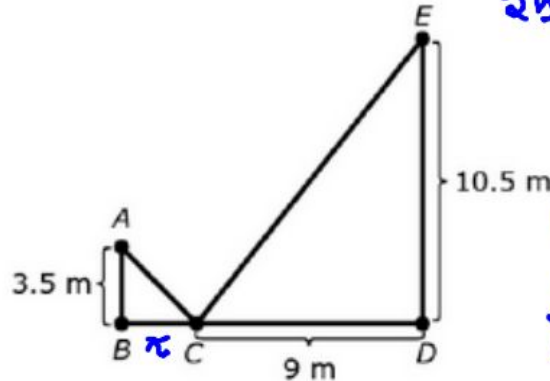
2nd way

$$\frac{3.5}{x} = \frac{10.5}{9}$$

$$10.5x = 31.5$$

$$\frac{10.5x}{10.5} = \frac{31.5}{10.5}$$

$$x = 3$$

What is the length, in meters, of $\overline{BC}$ ? **3 meters**

# Unit Map - Geometry

Wednesday - Parallel Lines Cut by a Transversal
Thursday - Proving Lines Parallel and Perpendicular
Friday - Pythagorean Theorem and its Converse
Monday - Distance and Midpoint Formula
Tuesday - Use coordinates to solve geometric problems
Wednesday - NO SCHOOL - TEACHERS MARCH
Thursday - Geometry Review
**Friday - Geometry Test**

# Announcements

Last unit!  Geometry!

Geometry test is next week on Friday

Flashback Friday starting for real this Friday

EOC review will begin soon - The EOC will be on May 30th.

Panera Study Day on May 27 from 2-5 PM

# Parallel Lines Cut By A Transversal

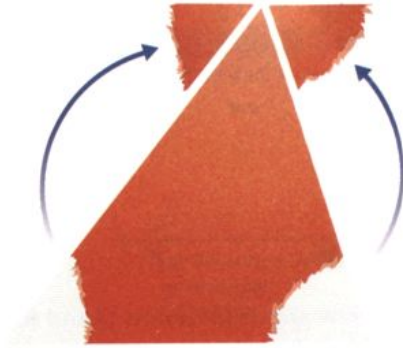4/24/2019

# Parallel Lines Cut By A Transversal

4/24/2019

Today's lesson is going to FLY - so get ready!

# Angles in a triangle

If you tear off two corners of a triangle and place them next to the third corner, the three angles seem to form a straight line.

… Because we know that a straight line has 180°, we can remember that a triangle has 180°
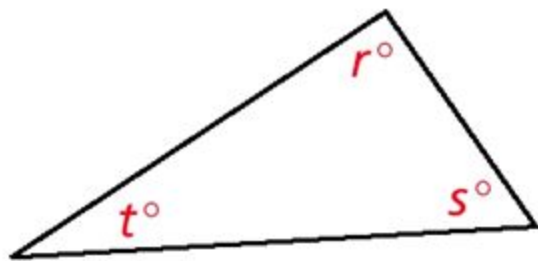
## TRIANGLE SUM THEOREM

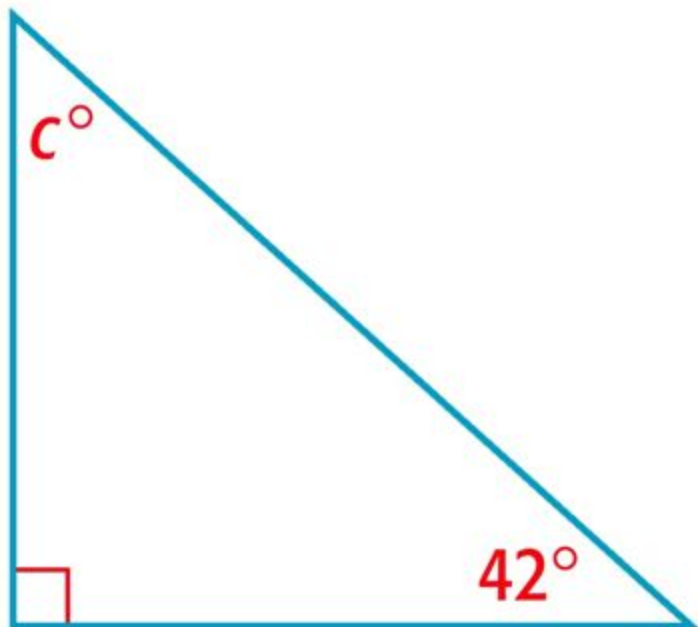| Words | Numbers | Algebra |
|---|---|---|
| The angle measures of a triangle in a plane add to 180°. | $43° + 58° + 79° = 180°$ | $r° + s° + t° = 180°$ |
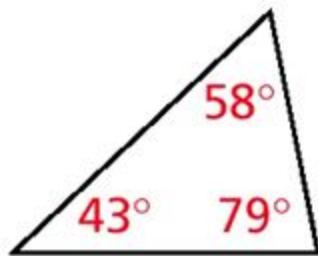
# Remember… You can classify triangles by their angles

An **acute triangle** has 3 acute angles. A **right triangle** has 1 right angle. An **obtuse triangle** has 1 obtuse angle.
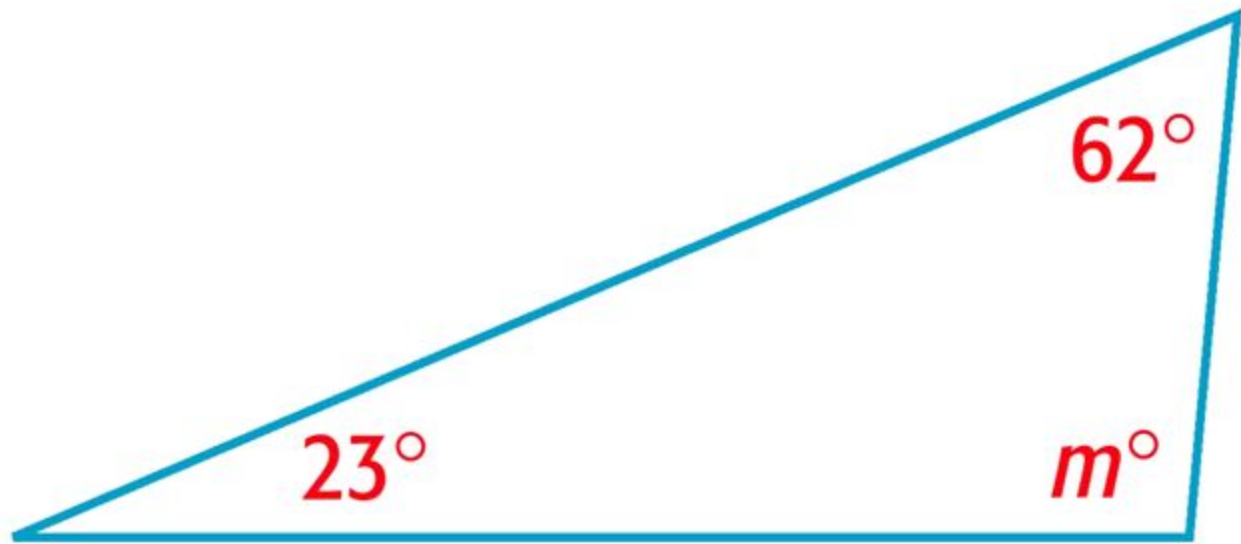
# Find *p* in the acute triangle.
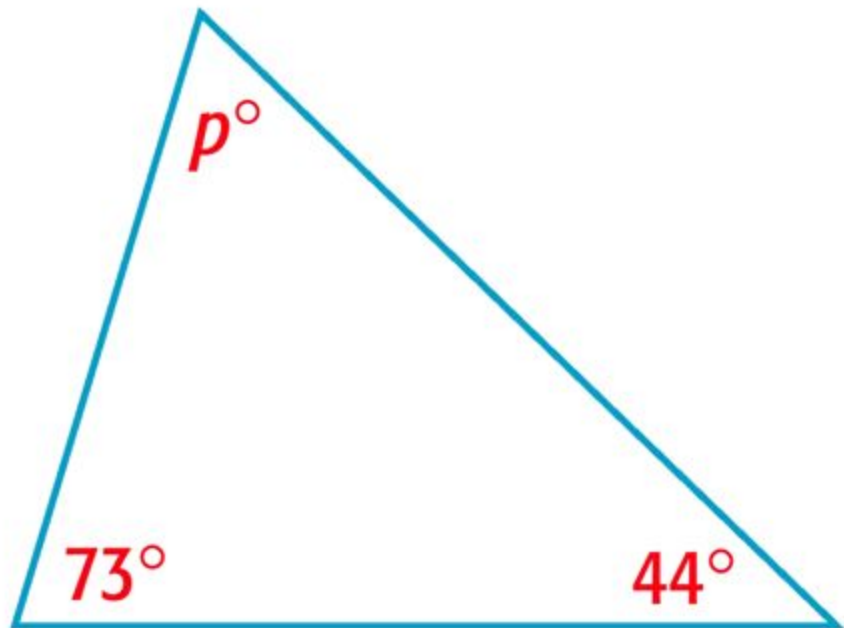
**Find *c* in the right triangle.**

$c°$

$42°$

**Find _m_ in the obtuse triangle.**



62°

23°

_m_°

Remember… you can classify triangles by their sides

An **equilateral triangle** has 3 congruent sides and 3 congruent angles. An **isosceles triangle** has at least 2 congruent sides and 2 congruent angles. A **scalene triangle** has no congruent sides and no congruent angles.
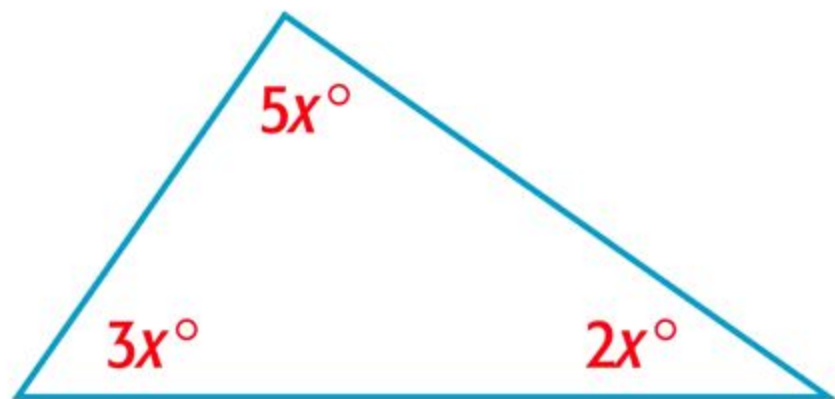
# Find angle measures in the equilateral triangle.

$b°$

$b°$        $b°$
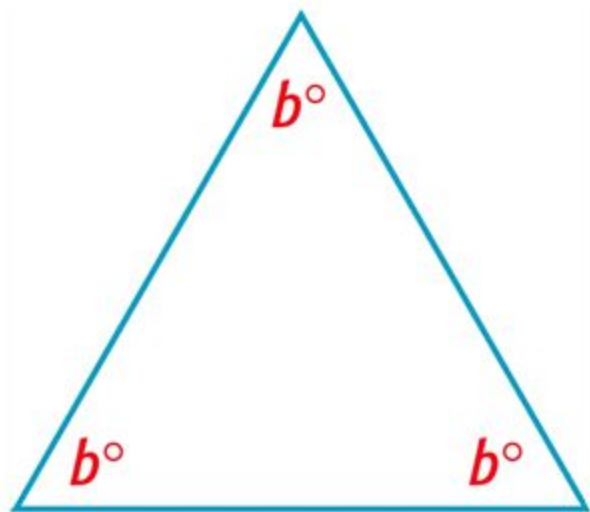
# Find angle measures in the isosceles triangle.
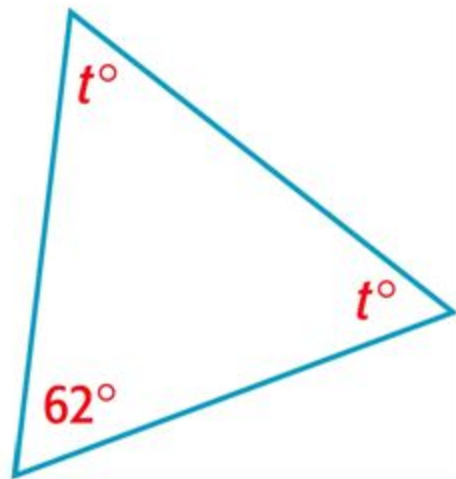
# Find angle measures in the scalene triangle.

The second angle in a triangle is six times as large as the first. The third angle is half as large as the second. Find the angle measures and draw a possible picture.
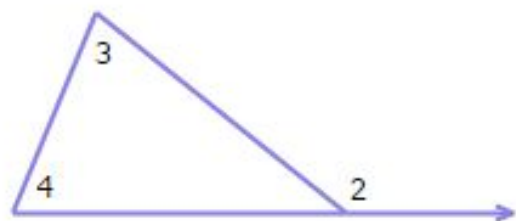
# Exterior Angles

## Definition

At each vertex of a triangle, an exterior angle of the triangle may be formed by extending ONE SIDE of the triangle. See picture below.
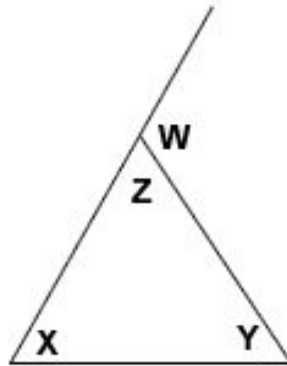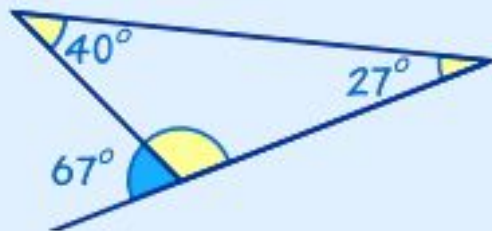
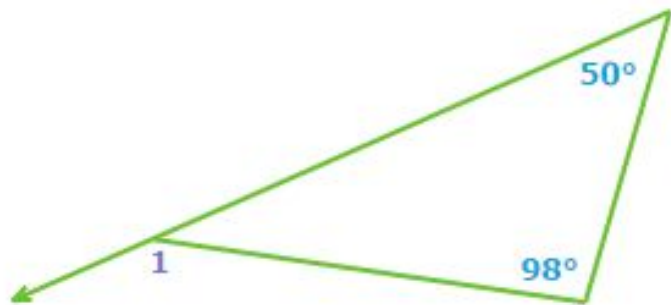The measure of an exterior angle of a triangle equals the sum of the two remote interior angle measures.

$$m\angle 2 = m\angle 3 + m\angle 4$$

# Example:



The exterior angle is **40° + 27° = 67°**

∠1 is an exterior angle of the triangle. The two remote interior angles measure 50° and 98°.



To find the exterior angle measure, add the two remote interior angle measures.

$m\angle 1 = 50° + 98°$

$\quad = 148°$       *Add*

So, $m\angle 1 = 148°$.

What is $m\angle 1$?



50°
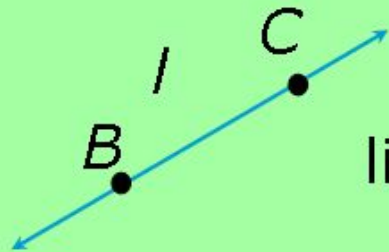
1

98°

A **point** names a location.
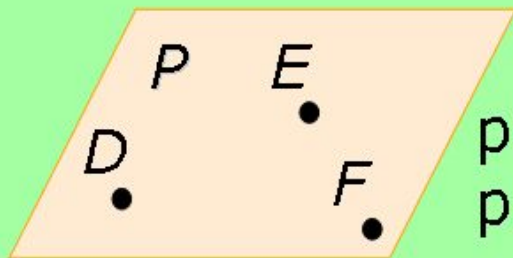
• A                    Point A

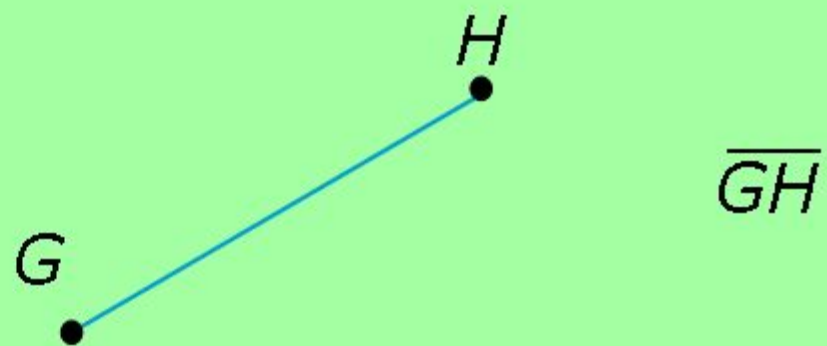A **line** is perfectly straight and extends forever in both directions.

line *l*, or $\overleftrightarrow{BC}$

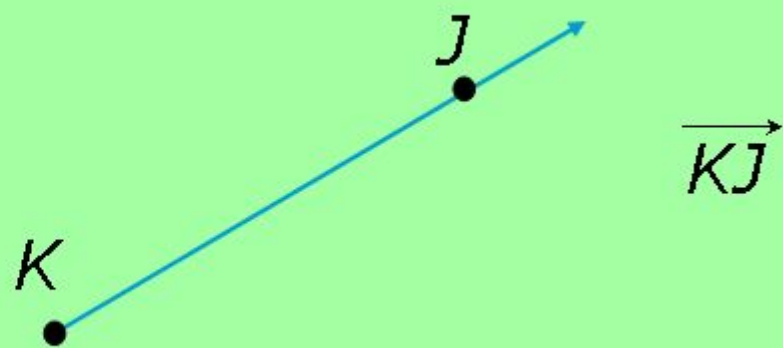A **plane** is a perfectly flat surface that extends forever in all directions.

plane *P*, or plane *DEF*

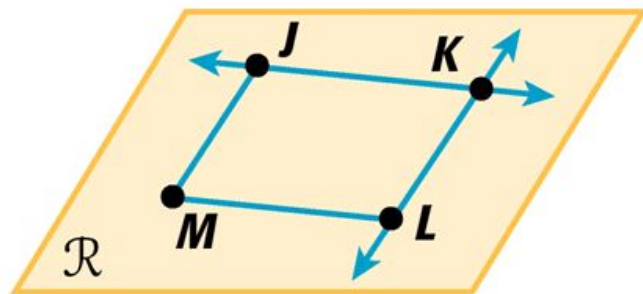A **segment**, or line segment, is the part of a line between two points.

$\overline{GH}$

G

H

A **ray** is a part of a line that starts at one point and extends forever in one direction.

$\overrightarrow{KJ}$

K

J

# Name 4 points in the figure.

## Name a line in the figure.

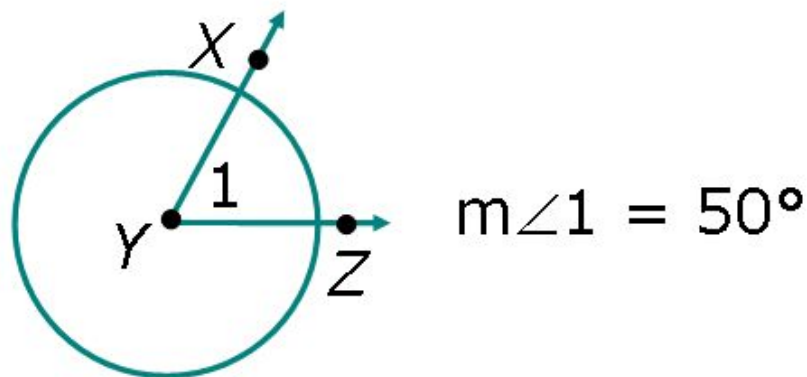# Name a plane in the figure.



# Name four segments in the figure.

# Name four rays in the figure.

An **__angle__** ($\angle$) is formed by two rays with a common endpoint called the *vertex* (plural, *vertices*). Angles can be measured in degrees. One degree, or 1°, is $\frac{1}{360}$ of a circle. m$\angle$1 means the measure of $\angle$1. The angle can be named $\angle$XYZ, $\angle$ZYX, $\angle$1, or $\angle$Y. The vertex must be the middle letter.

m$\angle$1 = 50°

A **right angle** measures 90°.

An **acute angle** measures less than 90°.

An **obtuse angle** measures greater than 90° and less than 180°.

**Complementary angles** have measures that add to 90°.

**Supplementary angles** have measures that add to 180°.

**Congruent** figures have the same size and shape.

• Segments that have the same length are congruent.

• Angles that have the same measure are congruent.

• The symbol for congruence is ≅, which is read "is congruent to."

Intersecting lines form two pairs of **vertical angles**. Vertical angles are always congruent, as shown in the next example.

**In the figure, $\angle 1$ and $\angle 3$ are vertical angles, and $\angle 2$ and $\angle 4$ are vertical angles.**

**A. If $m\angle 1 = 37°$, find $m\angle 3$.**
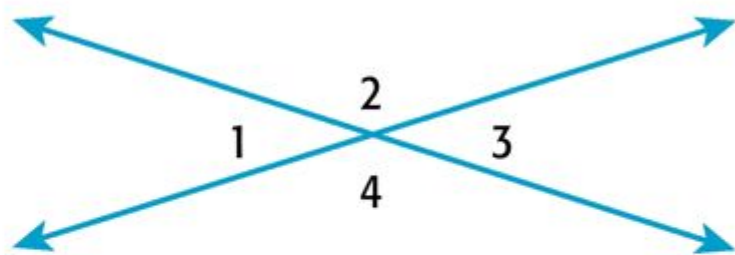
The measures of $\angle 1$ and $\angle 2$ add to 180° because they are supplementary, so $m\angle 2 = 180° - 37° = 143°$.

**In the figure, $\angle 1$ and $\angle 3$ are vertical angles, and $\angle 2$ and $\angle 4$ are vertical angles.**
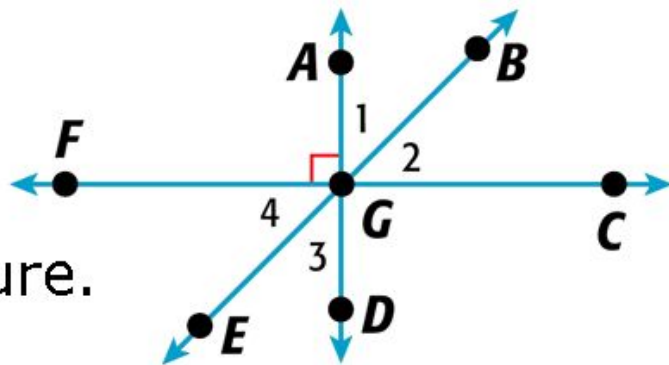
**1.** Name three points in the figure.

**2.** Name two lines in the figure.

**3.** Name a right angle in the figure.
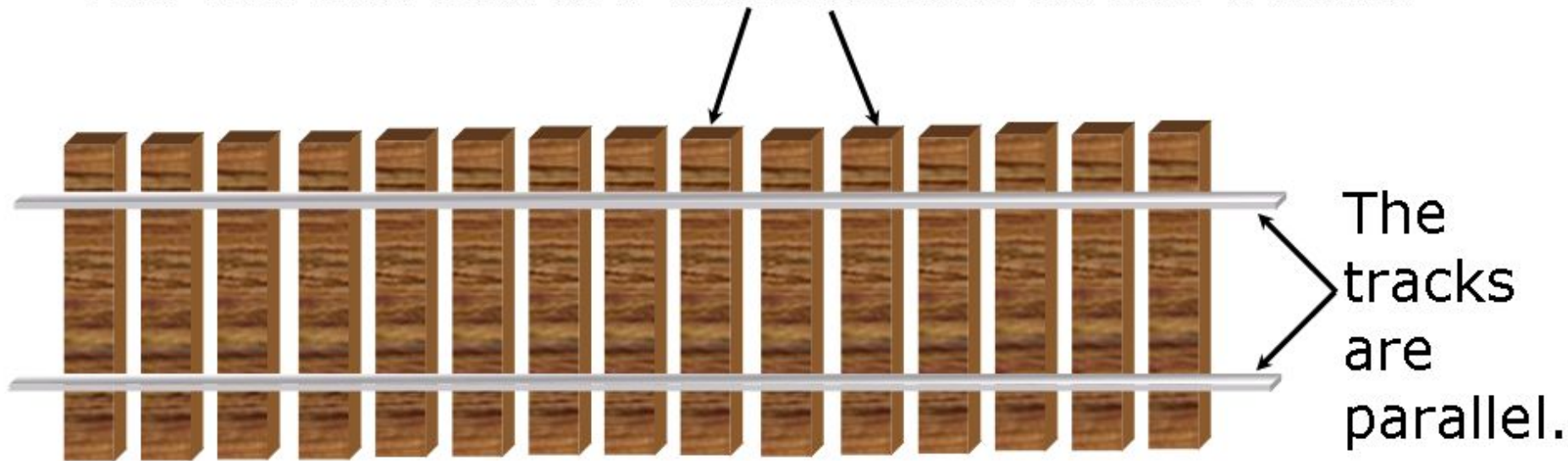
**4.** Name a pair of complementary angles.

**5.** If $m\angle 1$ 47°, then find $m\angle 3$.

**Parallel lines** are two lines in a plane that never meet, like a set of perfectly straight, infinite train tracks.

**Perpendicular lines** are lines that intersect to form 90° angles.

The railroad ties are *transversals* to the tracks.



The tracks are parallel.

A **transversal** is a line that intersects any two or more other lines. Transversals to parallel lines have interesting properties.

Angles marked in blue appear to be congruent to each other, and angles marked in red appear to be congruent to each other.
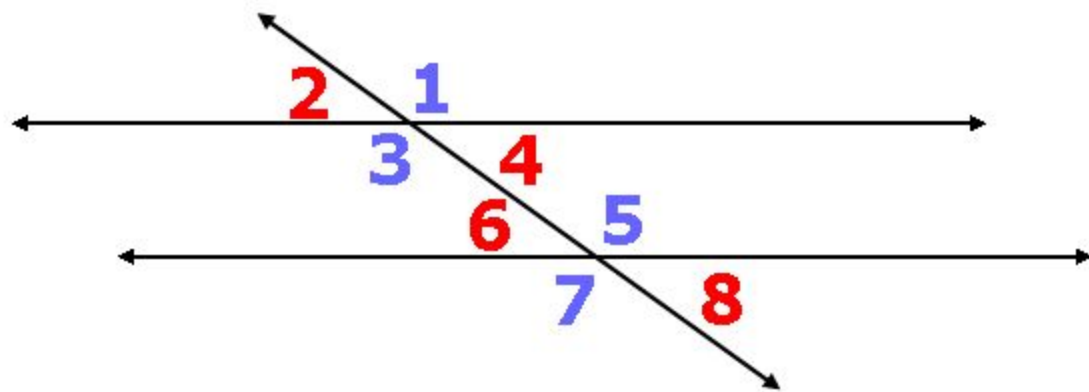
## PROPERTIES OF TRANSVERSALS TO PARALLEL LINES

If two parallel lines are intersected by a transversal,

• the acute angles that are formed are all congruent,

• the obtuse angles are all congruent,

• and any acute angle is supplementary to any obtuse angle.

If the transversal is perpendicular to the parallel lines, all of the angles formed are congruent 90° angles.
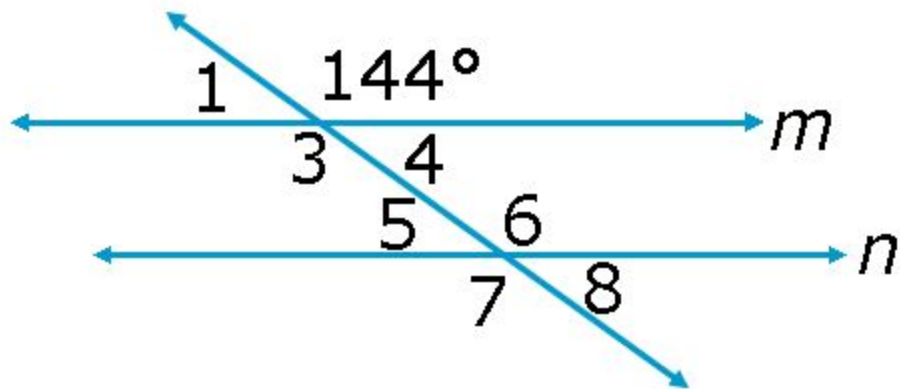
## Writing Math

The symbol for parallel is ||. The symbol for perpendicular is ⊥.
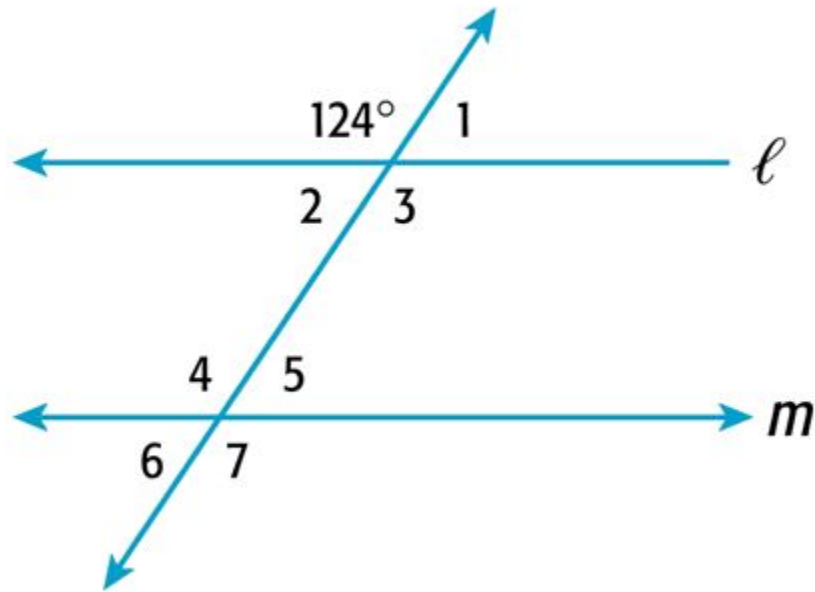
Find the missing angles.  For each angle give the term or definition that allowed you to find the missing angle.

For example, I know angle 2 is 56 degrees because it is supplementary with the 124 degree angle.
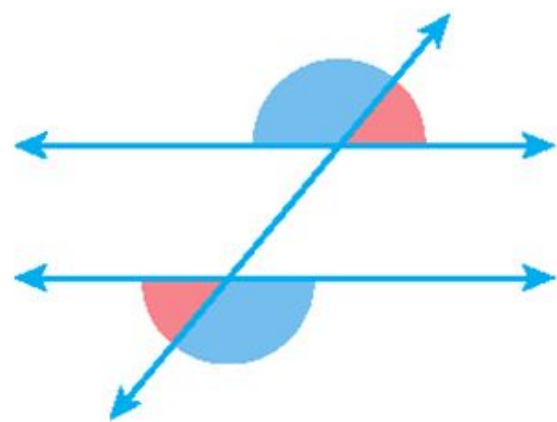
Find the missing angles. For each angle give the term or definition that allowed you to find the missing angle.
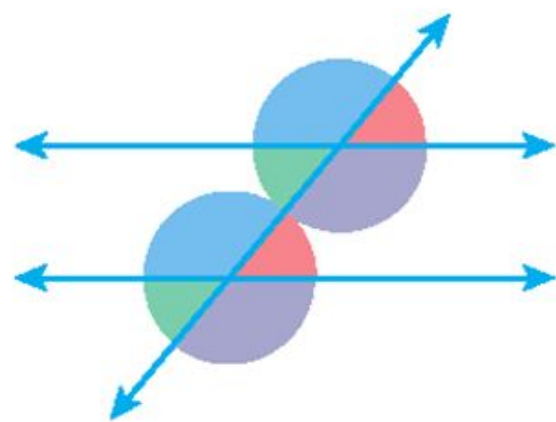
If two lines are intersected by a transversal and any of the angle pairs shown below are congruent, then the lines are parallel. This fact is used in the construction of *parallel lines*.
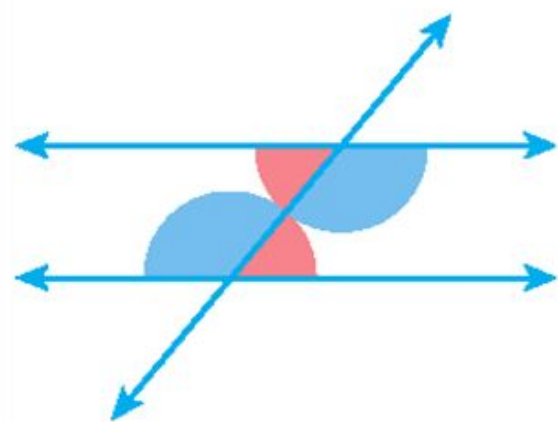


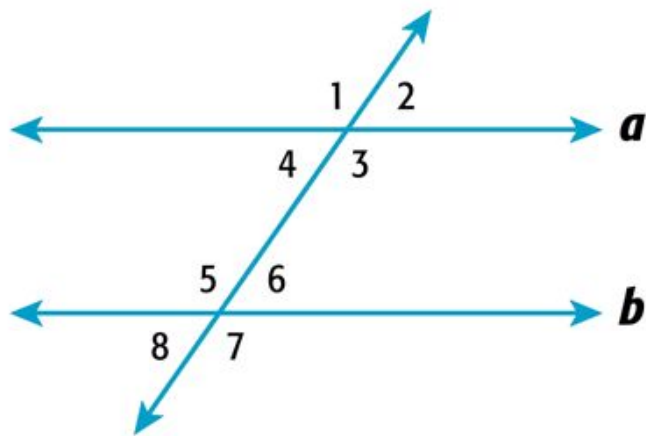**Alternate interior**          **Alternate exterior**          **Corresponding**

# In the figure *a* || *b*.

**1.** Name the angles congruent to ∠3.

**2.** Name all the angles supplementary to ∠6.

**3.** If $m\angle 1 = 105°$ what is m∠3?

**4.** If $m\angle 5 = 120°$ what is m∠2?

# Homework -

1) Print the worksheets on my website (both on the same linked document)
2) Complete ONE of the worksheets for homework
3) The other worksheet will be your warm-up tomorrow, so make sure you bring them both to school!