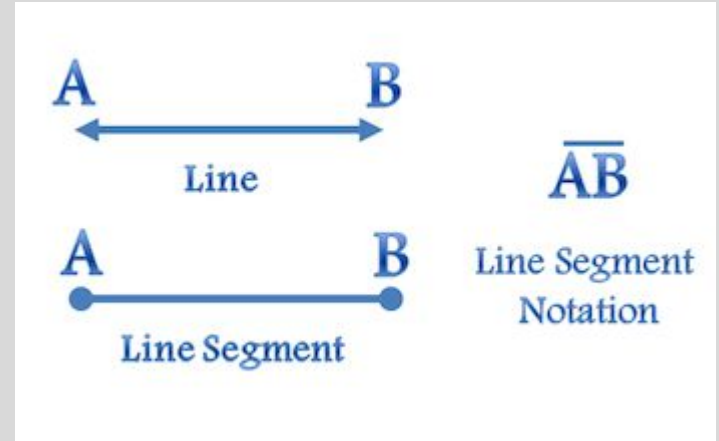# Lines, Angles, and Triangles

Notes and Student Work
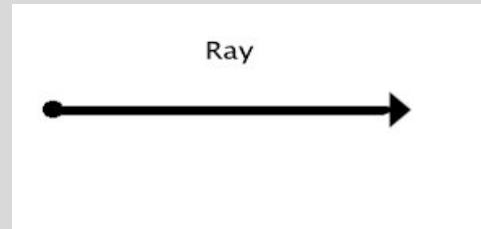
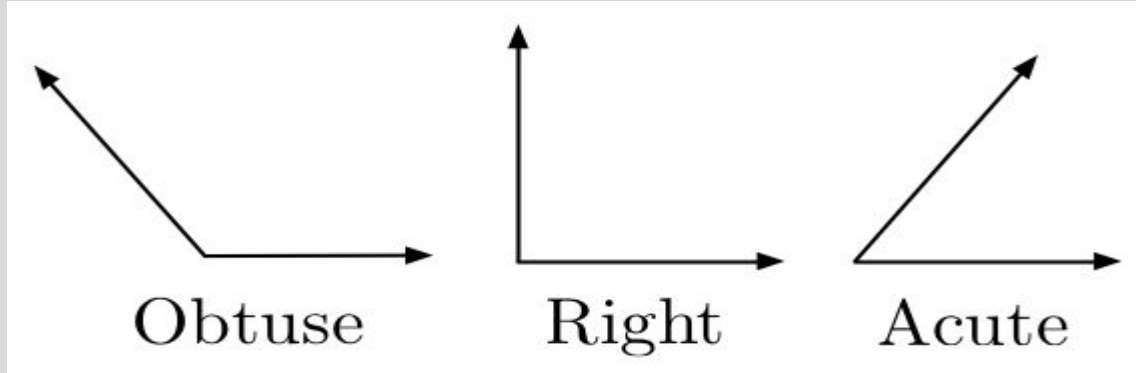# 1) Lines:

Line: a continuous extent of length.

Line Segment: a portion of a line with two distinct endpoints.

Ray: a straight line that begins at a point and extends forever in one direction.

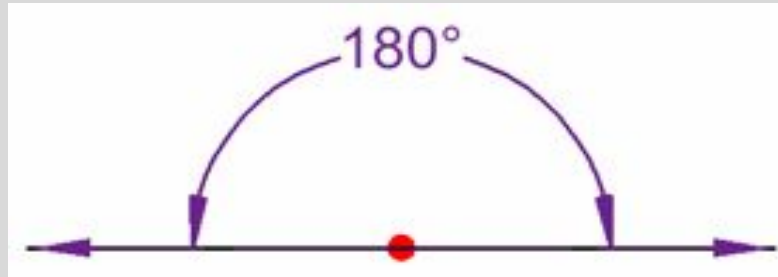# 2) <u>Angles</u>:

<u>Obtuse angle</u>: measure is greater than 90°

<u>Right angle</u>: measure is equal to 90°

<u>Acute angle</u>: measure is less than 90°
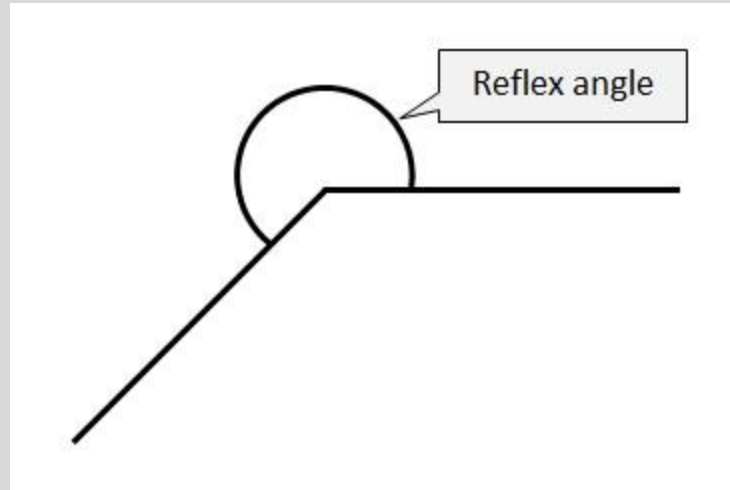
Continued:

Straight angle:

measure is equal to 180°

Continued:
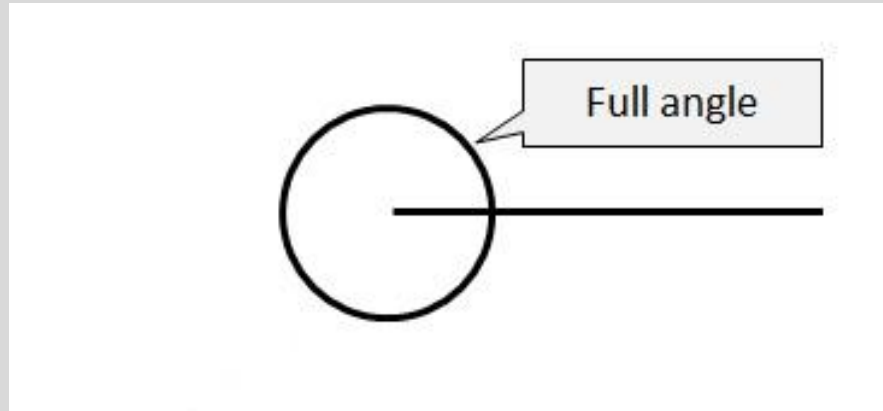
<u>Reflex angle</u>:

measure is greater than 180°

Continued:

Full Angle:

measure is equal to 360°

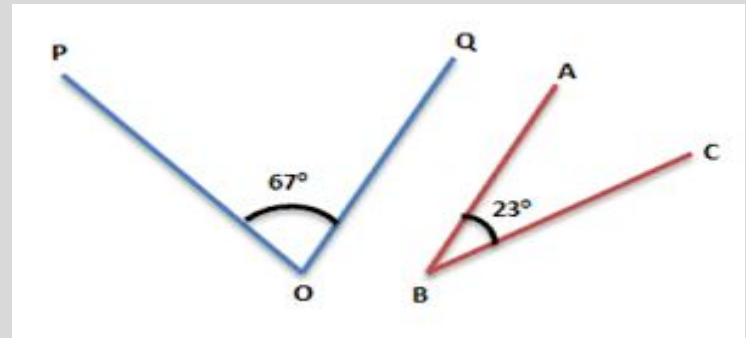# Adjacent Angles:
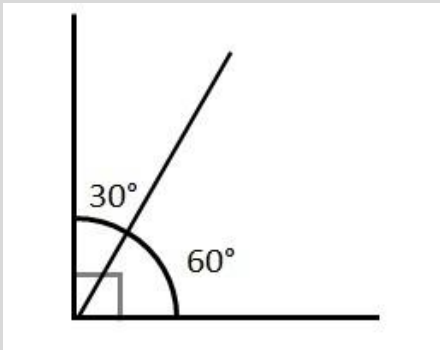
Definition:

Examples:

3) Angle Relationships:

Complementary Angles:

Definition: two angles that have a sum of 90°

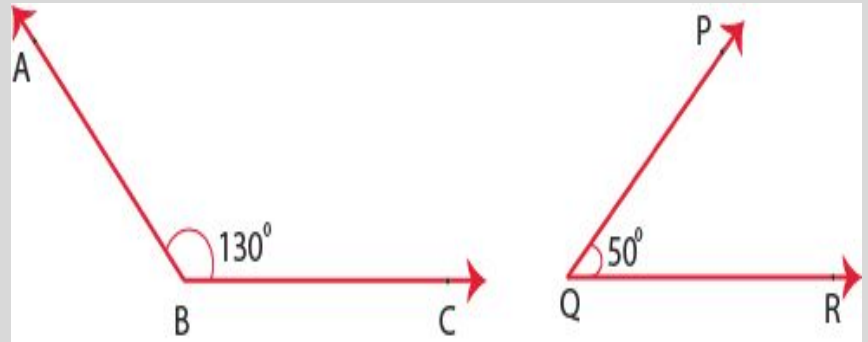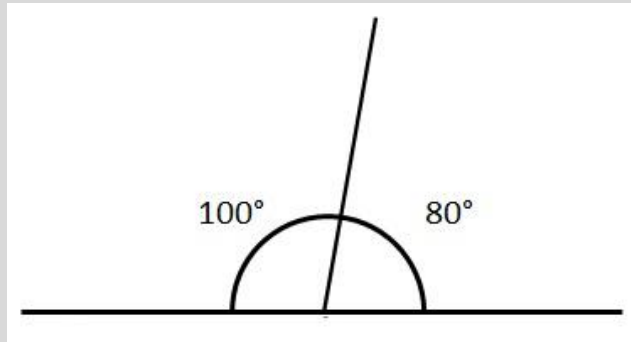*The angles do not have to be together (non-adjacent)

Ex.:

Continued:

Supplementary Angles:

Definition: two angles that have a sum of 180°

*The angles do not have to be together (non-adjacent)
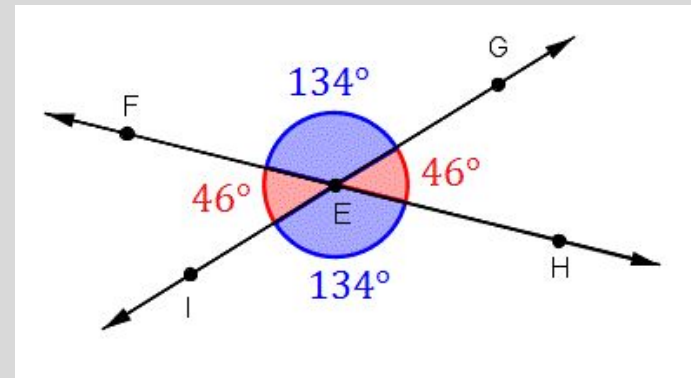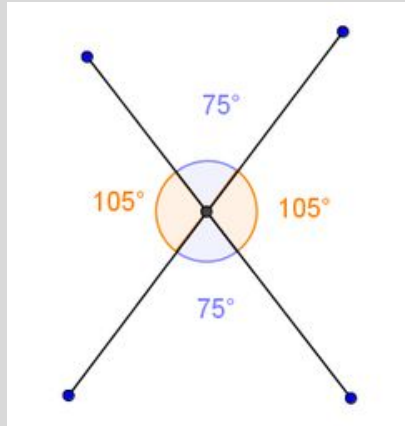
Ex.:

Continued:

Vertically Opposite Angles (vertical angles):

- vertically opposite angles will always be <u>congruent</u> (equal in measure)
- these angles are formed by <u>intersecting lines</u>
- non-adjacent angles (opposite a shared vertex, but do not share a ray)

Ex.:

Continued:

Parallel Lines Cut by a Transversal:

- **Corresponding**: congruent, non-adjacent, and appear on the same side of the transversal.

- **Alternate Interior**: congruent, non-adjacent, on opposite sides of the transversal, and lie inside the parallel lines.

- **Alternate Exterior**: congruent, non-adjacent, on opposite sides of the transversal, and lie outside the parallel lines.

- **Consecutive Interior** (same side interior): supplementary, non-adjacent, on the same side of the transversal, and lie inside the parallel lines.

- **Consecutive Exterior** (same side exterior): supplementary, non-adjacent, on the same side of the transversal, and lie outside the parallel lines.

Examples:
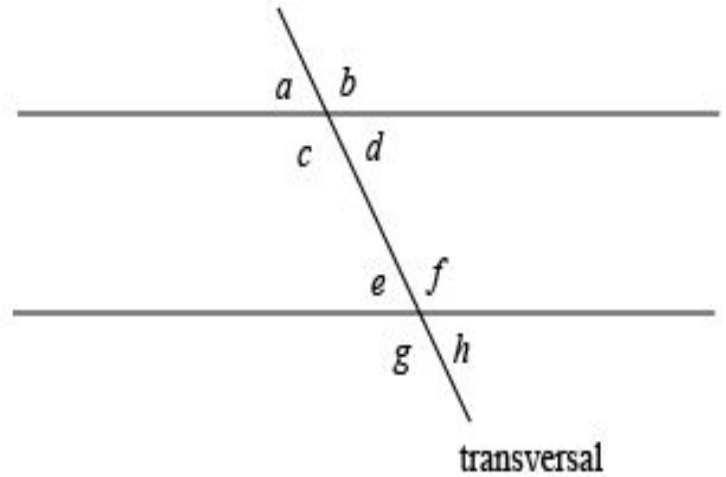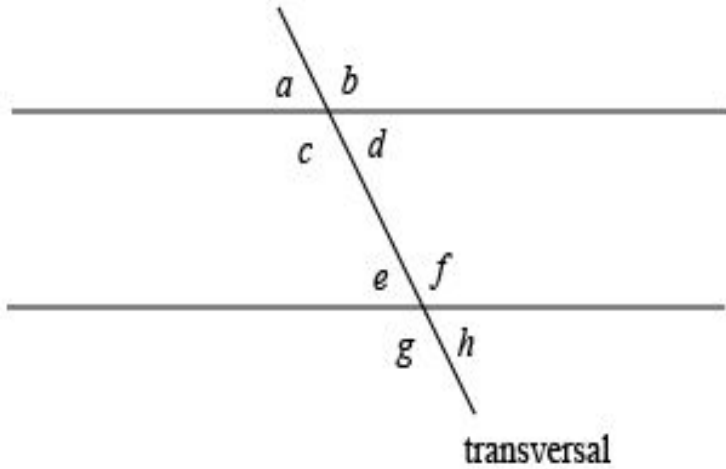
Examples:
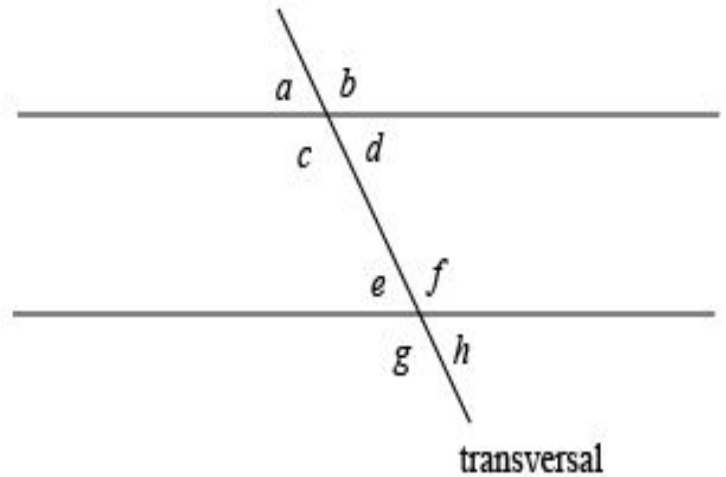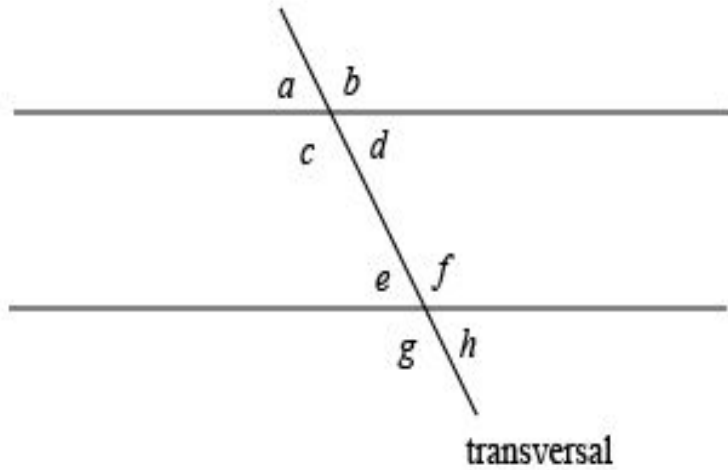
4) <u>Triangles</u>:

When classifying a triangle, we must identify the type of triangle according to both the <u>side measures and interior angles</u>.

a) **<u>Types of triangles based on side measures</u>:**

- **Scalene:** all three sides of the triangle have different measures.

- **Isosceles:** two congruent sides, but the third side has a different measure.

- **Equilateral:** all three sides are congruent (an equilateral triangle can also be isosceles because it does have 2 sides that are congruent).

Continued:

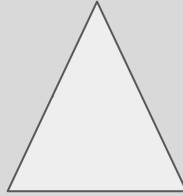**b) <u>Types of triangles based on interior angles</u>:**

- **Acute:** all interior angles are less than 90°

- **Right:** one interior angle is equal to 90°

- **Obtuse:** one interior angle is greater than 90°

<u>*The sum of the interior angles of a triangle is always 180°</u>
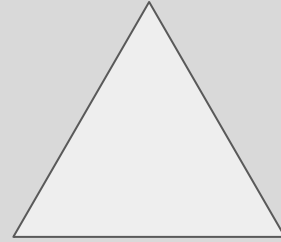
Examples:

right, scalene   acute, isosceles   acute, equilateral

*Add lines to show congruent sides, and any angle measures