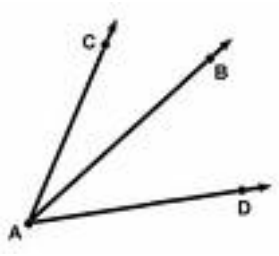
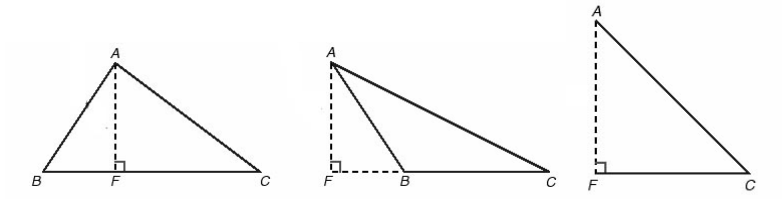
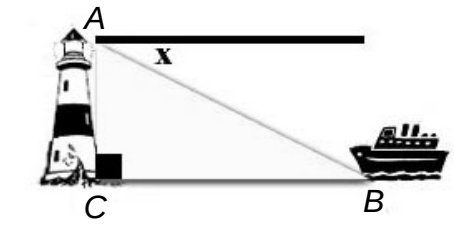
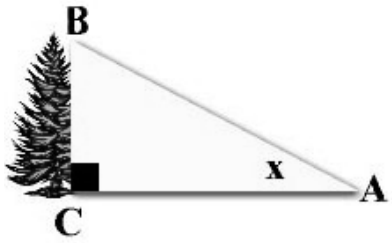
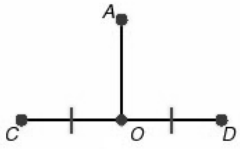
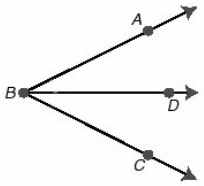
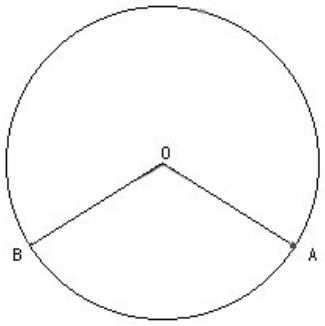
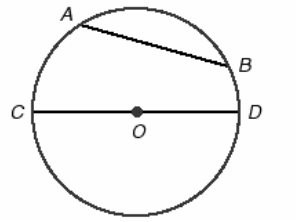
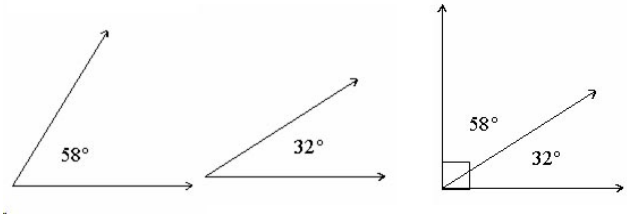
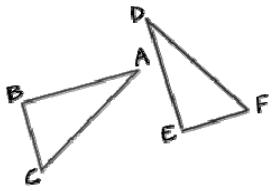
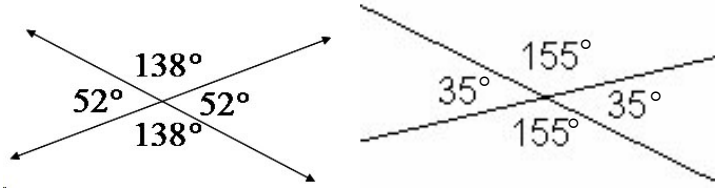
Geometry / Technical Geometry

Adjacent angles: Two angles in the same plane that are next to each other and share a common side and a common vertex.	$\angle CAB$ and $\angle BAD$ are adjacent. Ray *AB* is their common side and point *A* is their common vertex. 
Altitude of a triangle: The perpendicular segment from a vertex to the line containing the opposite side of a triangle.	In each triangle, the altitude to side *BC* is segment *AF*: 
Angle of Depression: An angle formed by a horizontal line and the line of sight below it.	 Angle *x* is the angle of depression. It is congruent to $\angle ABC$
Angle of Elevation: An angle formed by a horizontal line and the line of sight above it.	Angle *x* is the angle of elevation. 
Bisect: To divide into two equal parts. An angle bisector is a ray in the interior of an angle that divides the angle into two congruent angles. A bisector of a segment contains the midpoint of the segment and divides it into two congruent segments. The bisector can be a line, a segment, a ray or a plane.	 Segment *AO* bisects Segment *CD*  Ray *BD* bisects $\angle ABC$

Central Angle of a circle: An angle in a circle whose vertex is the center of the circle and whose sides intersect the circle.	Angle *BOA* is a central angle. 
Chord of a circle: A segment whose endpoints are points on the circle. The longest chord of a circle is the diameter.	Segments *AB* and *CD* are chords of the circle. The diameter $\overline{CD}$ is the longest chord of the circle. 
Complementary Angles: Two angles whose sum is 90 degrees. $\angle A$ and $\angle B$ are complementary if and only if $\angle A + \angle B = 90^{\circ}$.	 A 58 degree angle and a 32 degree angle are complementary since 58 + 32 = 90. If complementary angles are adjacent, their exterior sides form a right angle.
Congruent figures: Two figures are congruent if they have exactly the same size and shape. Two polygons are congruent if their corresponding sides and angles are congruent. The symbol for congruence is $\cong$.	 $\Delta ABC \cong \Delta DEF$ $\overline{AB} \cong \overline{DE},\ \overline{BC} \cong \overline{EF},\ \overline{CA} \cong \overline{FD}$ $\angle A \cong \angle D,\ \angle B \cong \angle E,\ \angle C \cong \angle F$
Conjecture: To make an educated guess or a prediction about future outcomes based on patterns, logic or data	After measuring several pairs of vertical angles, a conjecture was made that vertical angles are congruent. This conjecture used inductive reasoning. 

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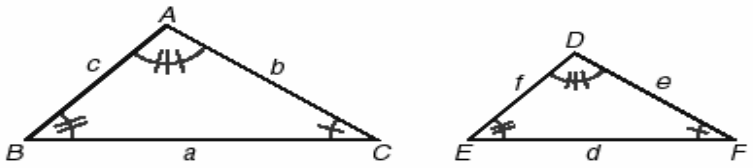
<tr>
<td>Corresponding Parts of congruent or similar figures: A side (or an angle) of a polygon that is matched with a side (or an angle) of a congruent or a similar polygon.
If the polygons are congruent, the corresponding parts are congruent.
If the polygons are similar, the corresponding angles are congruent and the corresponding sides are in proportion.</td>
<td>$\Delta ABC \cong \Delta DEF$
 

The corresponding angles of the two similar triangles are congruent: $\angle A \cong \angle D,\ \angle B \cong \angle E,\ \angle C \cong \angle F$
The corresponding sides are in proportion: $\frac{AB}{DE} = \frac{BC}{EF} = \frac{CA}{FD}$</td>
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<td>Deductive Reasoning: Using facts, definitions, properties, axioms and theorems to reach a logical conclusion or to show that a conjecture is true. It is reasoning from the general to the specific.</td>
<td>An example of deductive reasoning:
1. Given: Vertical angles are congruent
2. $\angle A$ and $\angle B$ are vertical angles
3. Therefore, $\angle A$ and $\angle B$ are congruent</td>
</tr>
<tr>
<td>Geometric Mean: The geometric mean occurs in a proportion when the two inner terms are the same. If $\frac{a}{x} = \frac{x}{b}$ then $x^2 = ab$ and $x = \sqrt{ab}$; x is the geometric mean.</td>
<td>
<table>
<tr><td>a - the first term (extreme)</td><td rowspan="2">$\frac{a}{x} = \frac{x}{b}$</td><td>x - the third term (mean)</td></tr>
<tr><td>x - the second term (mean)</td><td>b - the fourth term (extreme)</td></tr>
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<tr>
<td>Inductive Reasoning: A conclusion or a prediction is reached based on patterns or many observations. It is reasoning from the specific to the general.</td>
<td>An example of inductive reasoning:
1. A student measures several pairs of vertical angles
2. Each time, the angles in the pair are congruent
3. The student concludes that vertical angles are congruent.</td>
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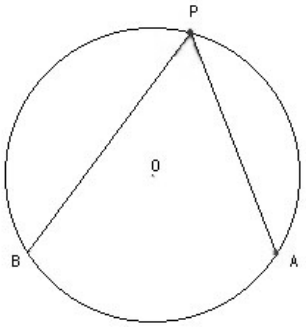
<td>Inscribed Angle in a circle: An angle whose vertex lies on the circle and whose sides lie on chords of the circle.</td>
<td>$\angle BPA$ is an inscribed angle.
 
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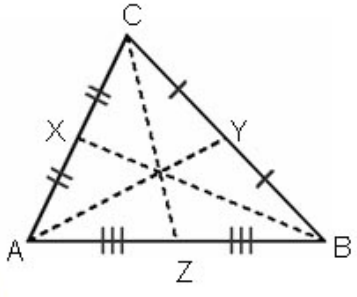
<td>Median of a Triangle: A segment which connects the vertex of a triangle to the midpoint of its opposite side.</td>
<td>The medians of the triangle are: $\overline{AY}, \overline{BX}, \overline{CZ}$
 
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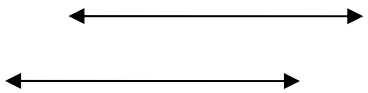
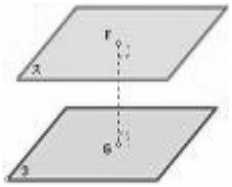
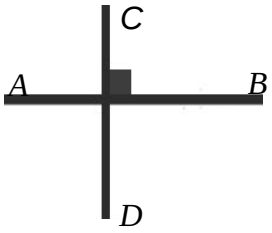
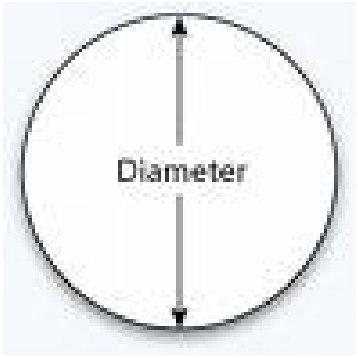
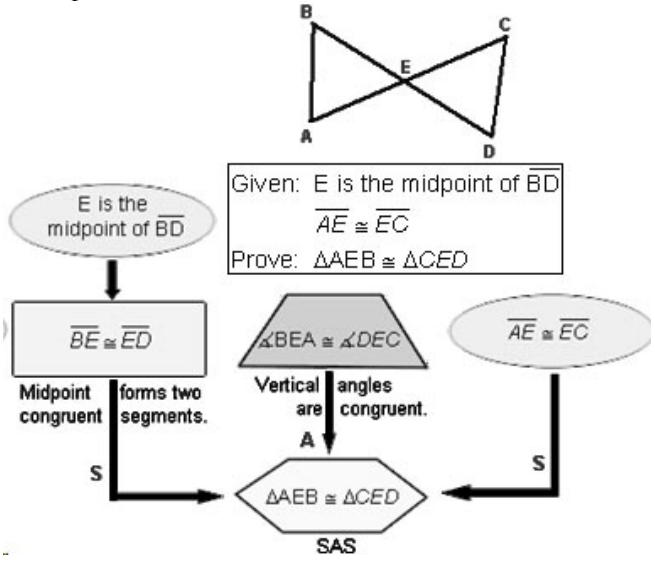
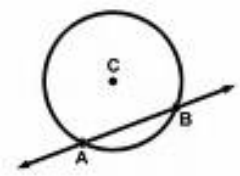
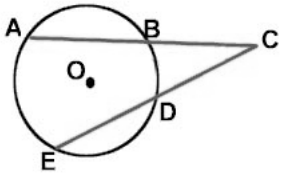
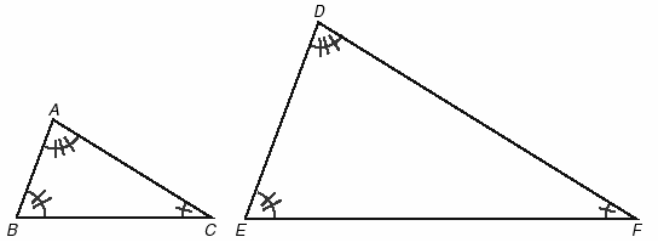
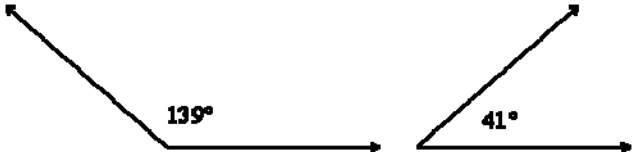
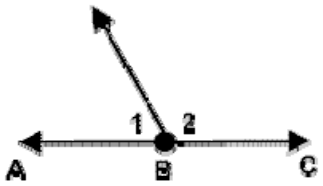
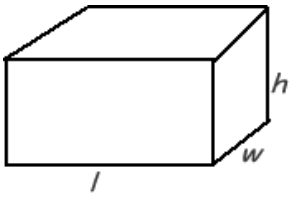
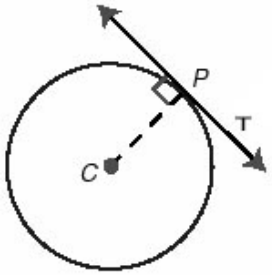
Parallel Lines: Lines that lie in a plane and do not intersect. (Parallel planes are planes which do not intersect)	 Parallel lines  Parallel planes
Perpendicular: Lines, segments, rays or planes that intersect to form right angles.	$\overline{AB} \perp \overline{CD}$ 
Pi: The ratio of the circumference of a circle to the length of its diameter. Approximations for pi are 3.14 and $\frac{22}{7}$	 $\pi = \frac{Circumference}{Diameter}$ $\pi \approx 3.141592$ 535897932384 626433832795 028841971693 9937510 58209 749445923078...
Proof: **Formal**: A logical argument using statements supported by reasons, containing axioms, postulates, definitions and theorems in a chain of deductive reasoning. **Paragraph**: A convincing argument that is written in complete sentences which starts with the hypothesis and ends with the conclusion. **Flow**: A way to organize ideas in a proof using arrows to display the relationships between the statements in the proof. **Coordinate**: A proof using ordered pairs and usually the distance formula, mid-point formula and/or the definition of slope to prove geometric conjectures.	Example of Flow Proof: 
Properties: **Reflexive**: Any segment or angle is congruent to itself. **Symmetric**: If $a = b$, then $b = a$. **Transitive**: If $a = b$ and $b = c$ then $a = c$.	Reflexive: $\angle A \cong \angle A$ or $AB \cong AB$ Symmetric: $\angle A \cong \angle B$, therefore $\angle B \cong \angle A$ Transitive: $\angle A \cong \angle B$, $\angle B \cong \angle C$, therefore $\angle A \cong \angle C$

Secant Line: A line that intersects a circle in exactly two points. A secant will contain a chord of the circle.	  Secant $\overleftrightarrow{AB}$ Angle *ACE* formed by secants *CA* and *CE*
Similar figures: Two figures are similar if their corresponding angles are congruent and their corresponding sides are in proportion. Similar figures have the same shape but different sizes. The symbol for similar is $\sim$.	 $\Delta ABC \sim \Delta DEF \quad \angle A \cong \angle D,\ \angle B \cong \angle E,\ \angle C \cong \angle F$ And $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$
Supplementary angles: Two angles whose sum is 180 degrees. $\angle A$ and $\angle B$ are supplementary if and only if $\angle A + \angle B = 180°$	 These two angles are supplementary since 139 + 41 = 180. Angles 1 and 2 are supplementary. $\angle 1 + \angle 2 = 180°$ If supplementary angles are adjacent, their exterior sides form a straight line. 
Surface Area of Solids: The surface area of a solid is the sum of the areas of the surfaces of the solid. The lateral area is the area of its lateral faces for a prism or pyramid and its curved lateral surface for a cylinder and a cone.	The surface area of the rectangular solid is $SA = 2lw + 2lh + 2wh$ 
Tangent Line: A line which intersects a figure or a solid in only one point.	$\overleftrightarrow{PT}$ is tangent to circle *C* at point *P*. It is perpendicular to radius $\overline{PC}$. 

Theorem: A statement which can be proved to be true.	Example: The Pythagorean Theorem, which states that the sum of the squares of the legs of a right triangle is equal to the square of the hypotenuse, can be proved many different ways.
Transversal: In a plane, a line that intersect two or more (usually parallel) lines.	Line *t* is a transversal which intersects parallel lines *l* and *m*.