Geometric Drawings

How many triangles can be formed with the given conditions?

- 2 angles and an included side
  → one unique triangle
- 2 sides and an included angle
  → one unique triangle
- 3 angles → many triangles
- 3 sides ~ Triangle Inequality
  $a + b > c$, c is the longest side
  → one unique triangle

Cross-Sections

- the intersection of a 3D figure and a plane

Angle Relationships

- congruent angles - angles with the same measure
- vertical angles - opposite angles formed when two lines intersect will be congruent
- adjacent angles - pairs of angles that share a vertex and one side and do not overlap

- Complementary angles - two angles whose sum is 90°
- supplementary angles - two angles whose sum is 180°

To solve problems involving missing angles, identify the relationship and create an equation. Use algebra to solve.

Angle theorems for Triangles

- the sum of the angles in a triangle is 180°
- the sum of the remote interior angles of a triangle is equal to the measure of the exterior angle

- interior angle - formed by two sides of a triangle
- exterior angle - formed by one side of the triangle and an extension of an adjacent side
- remote interior angle - an interior angle that is not adjacent to the exterior angle

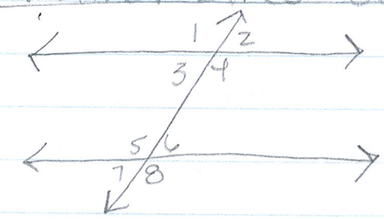
Angle - Angle Similarity

- similar figures - have the same shape but may have different sizes

Two triangles are similar if their corresponding angles are congruent and the lengths of the corresponding sides are proportional

Use a proportion to solve for missing lengths of a similar triangles

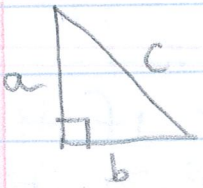
Parallel Lines Cut by a Transversal



refer to foldable

- corresponding - ∠1 ≅ ∠5 ∠2 ≅ ∠6 ∠3 ≅ ∠7 ∠4 ≅ ∠8
- alternate interior - ∠3 ≅ ∠6, ∠4 ≅ ∠5
- alternate exterior - ∠1 ≅ ∠8, ∠2 ≅ ∠7
- same side interior - ∠3 + ∠5, ∠4 + ∠6

Pythagorean Theorem $a^2 + b^2 = c^2$
only true for right triangles



a and b are the legs
c is the hypotenuse; the longest side opposite the right angle

if $a^2 + b^2 = c^2$ it is a right triangle
plug in value for a, b, or c to find the missing length

Distance formula:
$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

subtract x values for one length
subtract y values for the other length

Ex: (3,4) (8,10)
$d = \sqrt{(8-3)^2 + (10-4)^2}$
$d = \sqrt{5^2 + 6^2}$
$d = \sqrt{25 + 36}$
$d = \sqrt{61}$
$d \approx 7.8$