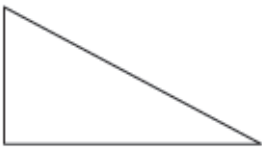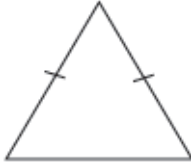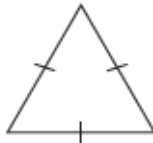Name: _____ Block: _____ Date: _____
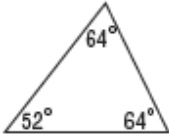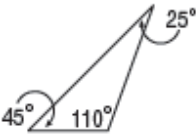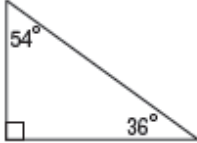
Triangle Review

- Triangles are three-sided polygons.
- The sum of the angles of a triangle is 180°.

We can classify triangles by their sides:

Classify Triangles by Sides		
Scalene Triangle	**Isosceles Triangle**	**Equilateral Triangle**
no congruent sides	at least two sides congruent	all sides congruent

We can classify triangles by their angles:

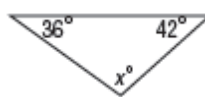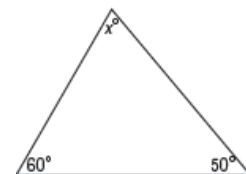| Classify Triangles by Angles		
Acute Triangle	**Obtuse Triangle**	**Right Triangle**
all acute angles	one obtuse angle	one right angle

You try:

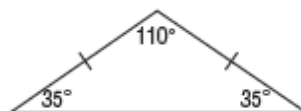Find the measure of the missing angle x…

a)

b)

c)

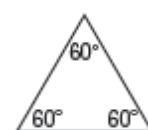Classify each triangle by its angles and sides…
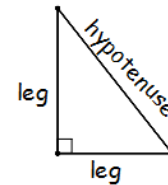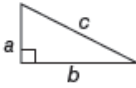
d)

e)

f)

1

Right Triangles and the Pythagorean Theorem

- Adjacent sides are called legs
- Side opposite the right triangle is called the hypotenuse

Pythagorean Theorem

Words If a triangle is a right triangle, then the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs.

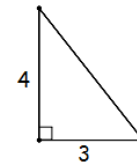**Model**   **Symbols** $a^2 + b^2 = c^2$

<u>Example</u>: Find the length of the hypotenuse using the Pythagorean Theorem:

Step 1: Write the Pythagorean Theorem: $a^2 + b^2 = c^2$
Step 2: Replace values (legs are a and b): $3^2 + 4^2 = c^2$
Step 3: Simplify: $9 + 16 = c^2$
                                                                      $25 = c^2$

      Take square root of both sides: $\sqrt{25} = \sqrt{c^2}$
                                                                      $5 = c$

The length of the hypotenuse is 5.

<u>Word Problem</u>: A ladder is leaning against a wall. If the ladder is 13 feet long, and the bottom of the ladder is 5 feet from the wall, how far up the wall will the top of the ladder reach?

Solution: We know one leg (5) and the hypotenuse (13). Substitute values into the Pythagorean Theorem to find the measure of the other leg:
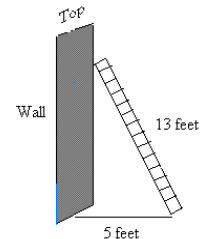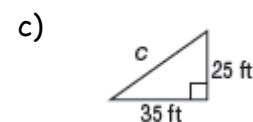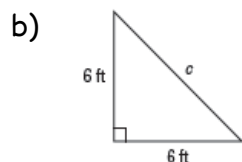
$a^2 + b^2 = c^2$
$5^2 + b^2 = 13^2$
$25 + b^2 = 169$
$b^2 = 169 - 25 = 144$
$\sqrt{b^2} = \sqrt{144}$ ⟶   b = 12. The ladder touches 12 feet up the wall.

You try: Find the length of the missing side, to the nearest tenth. Side "c" is the hypotenuse.

a)   15 in.   b)   c)
20 in.   c
   c   6 ft   c   25 ft
                                        35 ft
                   6 ft

d) a = 18, b = 80, c = ?   e) a = ?, b = 70, c = 74   f) a = 14, b = ?, c = 22

g) If the sides of a triangle are 6, 7, and 10, is the triangle a right triangle?