

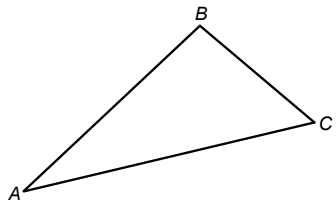
# Triangles (part 1)

title

Defn  
**Triangle**—a figure formed by three segments (*sides*) joining three noncollinear points (*vertices*)

Notes  
 > The symbol for a triangle is  $\Delta$ .  
 > Use the vertices to name a triangle.

$\Delta ABC$   
 $\Delta BCA$   
 $\Delta CBA$   
 $\Delta CAB$

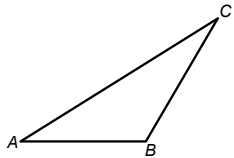


triangles

How to determine whether or not three segment lengths can form a triangle:

**Triangle Inequality Theorem**  
 The sum of the lengths of any two sides of a triangle is greater than the length of the third side.

$\overline{AB} + \overline{BC} > \overline{AC}$   
 $\overline{AB} + \overline{AC} > \overline{BC}$   
 $\overline{BC} + \overline{AC} > \overline{AB}$



triangle inequality thm

Is it possible to construct a triangle with the given side lengths?

3, 6, 8	4, 4, 10	7, 9, 16
$3+6 > 8$	$4+4 > 10$	$7+9 > 16$
$9 > 8$	$8 > 10$	$16 > 16$
yes	NO	NO
$\sqrt{5}, 2, 5$	$\sqrt{12}, 4, 2\sqrt{6}$	
$2.23 + 2 > 5$	$3.46 + 4 > 4.9$	
NO	yes	

examples

Describe the possible lengths of the third side of the triangle given the lengths of the other two sides.

11 cm and 15 cm

15-11      11+15

$4 < x < 26$

### How do we know the number of degrees in a Triangle?

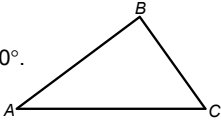
180°

examples

Oct 18-2:13 PM

**Triangle Sum Theorem**

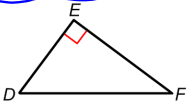
The sum of the measures of the interior angles of a triangle is  $180^\circ$ .



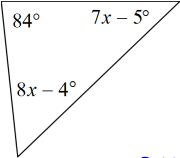
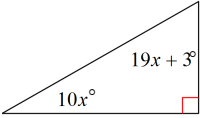
**Corollary to a theorem**—a statement that can be proved easily using a theorem

**Corollary to the Triangle Sum Theorem**

The acute angles of a right triangle are complementary.



Find the value of  $x$ .

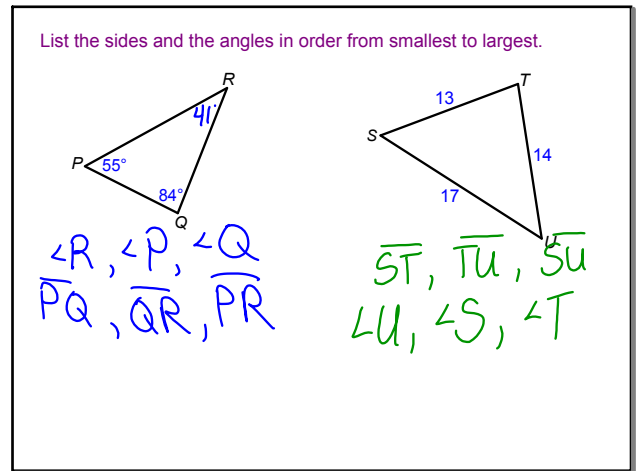
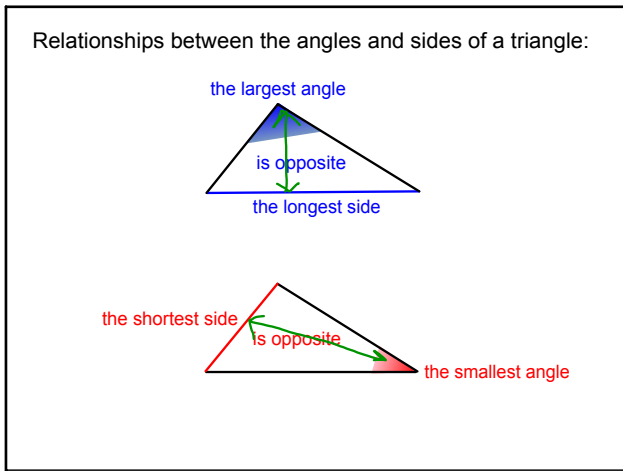



$8x - 4 + 7x - 5 + 84 = 180$   
 $15x + 75 = 180$   
 $15x = 105$   
 $x = 7$

$19x + 3 + 10x = 90$   
 $29x + 3 = 90$   
 $29x = 87$   
 $x = 3$

triangle sum thm

example



angle/side relationships

examples

**Conclusion**

- How do you figure out if 3 sides make a triangle? *Add 2 sides > Longest side*
- How are the sides and angles related? *short & across from short side*
- How many degrees are in a triangle?
- Questions???????? *180°*

**Assignment**  
**Triangles Wkst 1**