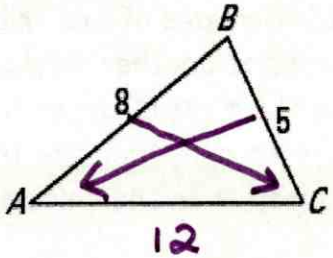
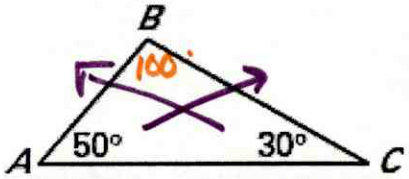
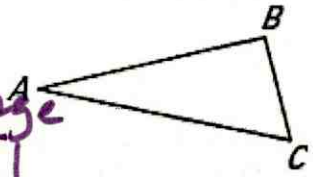
Section 5.5 - 5.6 Date_____

5.5

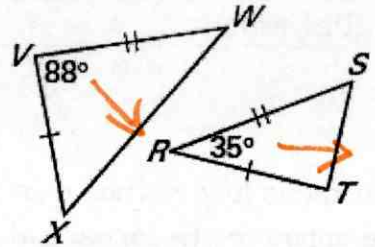
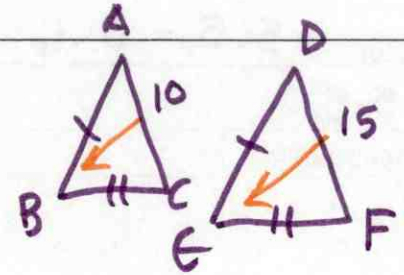
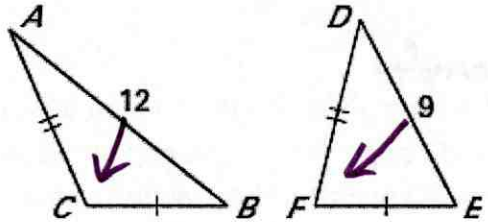
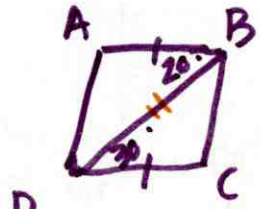
Use Inequalities in Triangles

Vocabulary	Definition	Example
THEOREM 5.10	If one side of a triangle is longer than another side, then the angle opposite the longer side is **larger** than the angle opposite the shorter side.	8 5 AB > BC, so m∠ C > m∠ A . 
THEOREM 5.11	If one angle of a triangle is larger than another angle, then the side opposite the larger angle is **longer** than the side opposite the smaller angle.	50° 30° m∠A > m∠C, so $\overline{BC}$ > $\overline{AB}$.  $\overline{AC}$ is the longest side
TRIANGLE INEQUALITY THEOREM	The sum of the lengths of any two sides of a triangle is greater than the length of the third side.	small + small > Large $\boxed{AB + BC > AC}$ AC + BC > AB AB + AC > BC  can you construct a Δ w/ side lengths of 2, 8, 9? 2 + 8 > 9 10 > 9 yes

5, 5, 10
5 + 5 > 10
10 > 10 NO

12, 18, 15
12 + 15 > 18
27 > 18 yes

5.6

HINGE THEOREM	If two sides of one triangle are congruent to two sides of another triangle, and the included angle of the first is larger than the included angle of the second, then the third side of the first is **longer** than the third side of the second.	  88 > 35 15 > 10 WX > ST ∠E > ∠B
CONVERSE of the HINGE THEOREM	If two sides of one triangle are congruent to two sides of another triangle, and the third side of the first is longer than the third side of the second, then the included angle of the first is **larger** than the included angle of the second.	  BC > AD 30 > 20 m∠C > m∠F 12 > 9

Describe possible side lengths of third side of a △ given 2 sides $a-b < x < a+b$

a is the larger #
b is the smaller #

b a
3, 5, x

$5-3 < x < 5+3$

$\boxed{2 < x < 8}$

12, 7, x

$12-7 < x < 12+7$

$\boxed{5 < x < 19}$

20, 4, x−5

$20-4 < x-5 < 20+4$

$16 < x-5 < 24$

$16 < x-5$
+5 +5
$21 < x$

$x-5 < 24$
+5 +5
$x < 29$

$\boxed{21 < x < 29}$