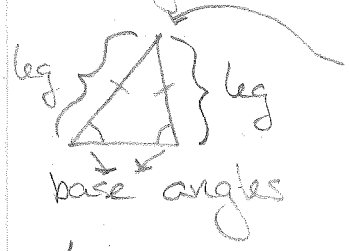
4.6: Isosceles, Equilateral, and Right Δ's

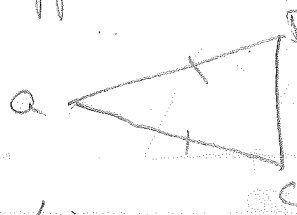
Objective: Use properties of isosceles, right, equilateral triangles

Using Properties of Isosceles Δ's



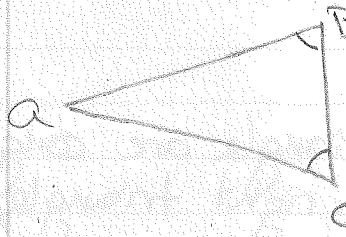
Warm-up: Have them create an isoseles Δ and measure the angles

Theorem 4.6: Base angle Theorem
If two sides of a triangle are congruent, then the angles opposite them are congruent.



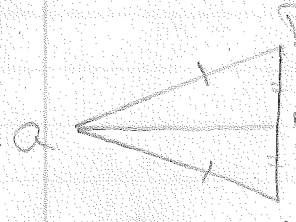
If $\overline{AB} \cong \overline{AC}$, then $\angle B \cong \angle C$

Theorem 4.7: Base Angle Converse
If two angles of a Δ are ≅, then the sides opposite them are ≅



If $\angle B \cong \angle C$, then $\overline{AB} \cong \overline{AC}$

Proof of Base Δ Theorem



Given: $\overline{AB} \cong \overline{AC}$
$\overline{AD}$ is a bisector
Prove: $\angle B \cong \angle C$

S	R
1) $\overline{AB} \cong \overline{AC}$	1) Given
2) $\overline{AD}$ is a bisector	2) Given
3) $\overline{BD} \cong \overline{DC}$	3) Def of bisector
4) $\overline{AD} \cong \overline{AD}$	4) reflexive
5) $\triangle ADB \cong \triangle ADC$	5) SSS
6) $\angle B \cong \angle C$	6) Corr. Parts of congruent Δ's

Corollary to the Base Angle Theorem

If a triangle is equilateral, then it is equiangular

Corollary to the Base Angle Converse

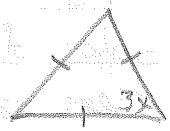
If a triangle is equiangular, then it is equilateral

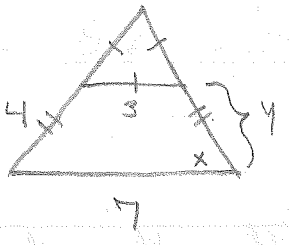
Using Equilateral and Isosceles Δ's

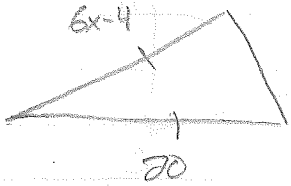
$x = 60°$

$y = 30°$

Now try:



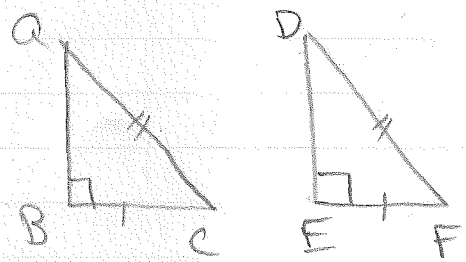




Using Properties of Right Triangles

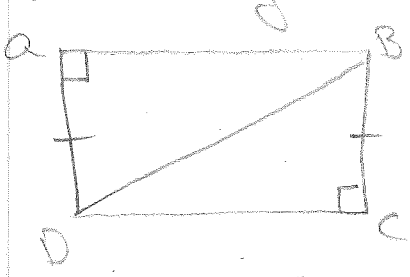
Theorem 4.8 Hypotenuse-Leg Theorem (HL)

If the hypotenuse and a leg of a right triangle are congruent to the hypotenuse and a leg of a second right triangle, then the two Δ's are ≅



If $\overline{BC} \cong \overline{EF}$
and $\overline{AC} \cong \overline{DF}$
then $\triangle ABC \cong \triangle DEF$

Proof using HL Theorem



Given: $\angle A, \angle C$ are right angles
$\overline{AD} \cong \overline{BC}$
Prove: $\triangle ADB \cong \triangle CBD$

S	R
1) $\angle A, \angle D$ are rt $\angle$'s	1) Given
2) $\overline{AD} \cong \overline{BC}$	2) Given
3) $\overline{DB} \cong \overline{DB}$	3) Reflexive
4) $\triangle ADB \cong \triangle CBD$	4) HL Theorem

Closure: What is the base angle theorem? Converse? If a triangle is equilateral, then what? How can we show right triangles are $\cong$?

Homework: 4.6B