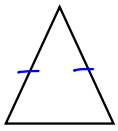
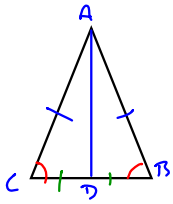
8.6 Isosceles and Congruent Parts



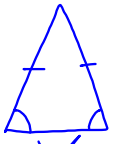


$\triangle ABC$ is Isosceles
$\overline{AD}$ is a bisector of $\overline{BC}$ and $\angle CAD$

$\triangle ABC$ is Isosceles	Given
$\overline{AC} \cong \overline{AB}$	def of Isosceles
AD bisector of BC	Given
$\overline{CD} \cong \overline{DB}$	def of bisector
$\overline{AD} \cong \overline{AD}$	Reflexive
$\triangle ACD \cong \triangle ABD$	SSS
$\angle ADB \cong \angle ADC$	corresponding parts of $\cong \triangle$'s

We now know something very important about Isosceles triangles

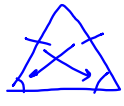
Base Angles are $\cong$



Base Angles

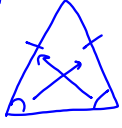
Base Angles Thm

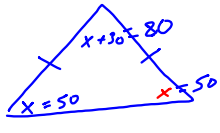
In an isosceles triangle, the angles opposite the congruent sides are congruent

if  then 

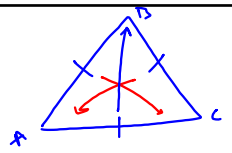
Base Angles Converse

If two angles in a triangle are congruent then the sides opposite the angles are congruent

if  then 



$x + x + x + 30 = 180$
$3x + 30 = 180$
$\frac{3x}{3} = \frac{150}{3}$
$x = 5$



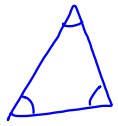
Equilateral

using base angles what do we see

$\angle A \cong \angle B \cong \angle C$

$\overline{AB} \cong \overline{BC}$
$\angle A \cong \angle C$
$\overline{AB} \cong \overline{AC}$
$\angle B \cong \angle C$
$\overline{BC} \cong \overline{AC}$
$\angle B \cong \angle A$

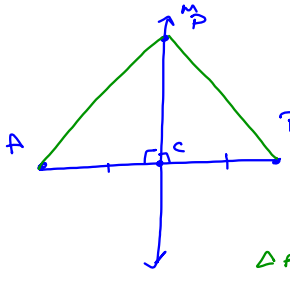
If the triangle is equilateral then it is equiangular

if  then 

Converse

If a triangle is equiangular then it is equilateral

if  then 



Since m bisects $\overline{AB}$ at C

$\overline{AC} \cong \overline{CB}$

Since $m \perp \overline{AB}$

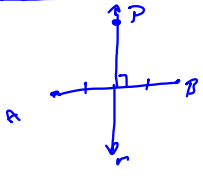
$\angle ACP \cong \angle BCP$ both right $\angle$'s

$\overline{PC} \cong \overline{PC}$

$\triangle APC \cong \triangle BPC$ by SAS

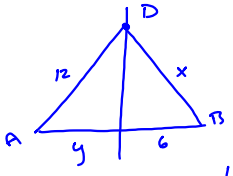
$\overline{AP} \cong \overline{BP}$

Perpendicular bisector



If P is on the $\perp$ bisector then P is equidistant from the endpoints AB

D is on $\perp$ bisector find x, y



$\overline{AP} \cong \overline{BP}$ what can we say about P

P is on the $\perp$ bisector