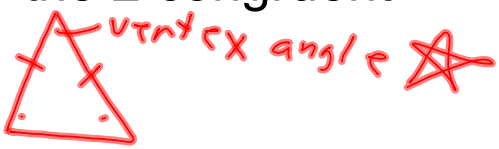
4-6 Isosceles Triangles

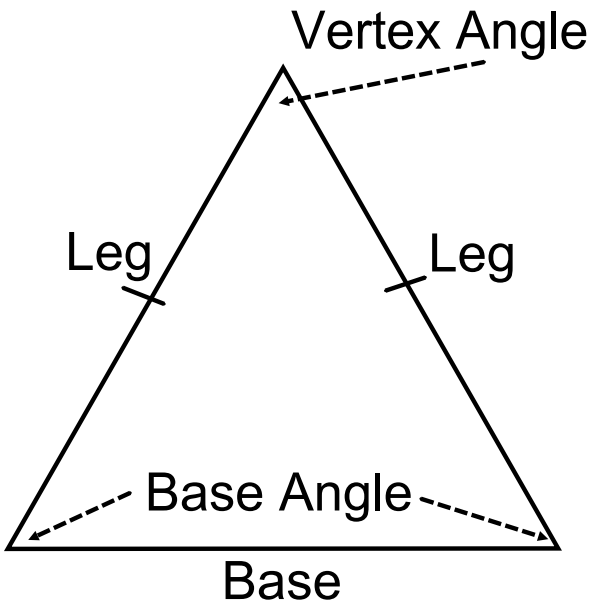
Isosceles Triangle:
* A triangle with at least two congruent sides.

Vertex Angle:
* The angle formed by the 2 congruent sides.



Base Angles:
* The 2 angles formed by the base and 1 of the congruent sides.

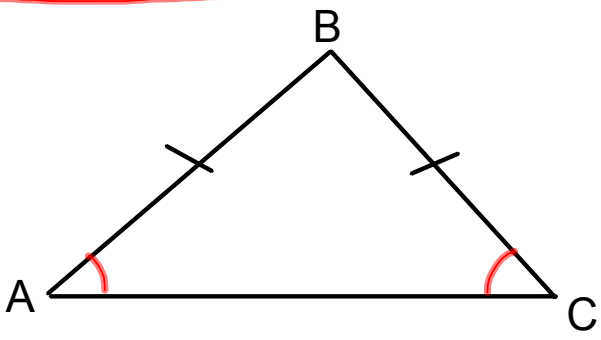
Legs:
* The two congruent sides.



Isosceles Triangle Theorem:

* If 2 sides of a triangle are congruent, then the angles opposite those sides are congruent.

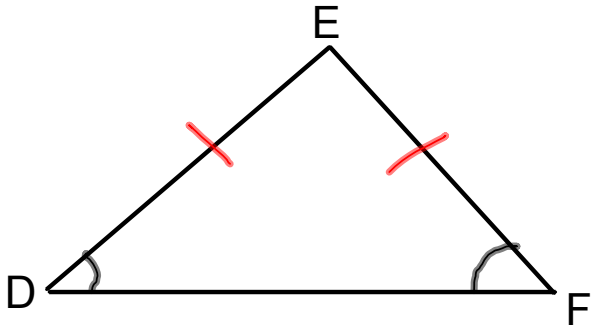
* Base angles are congruent.



If $\overline{AB} \cong \overline{CB}$, then $\angle A \cong \angle C$

Isosceles Triangle Converse Theorem:

* If 2 angles of a triangle are $\cong$, then the sides opposite those $\angle$'s are $\cong$.



If $\angle D \cong \angle F$, then $\overline{DE} \cong \overline{FE}$.

Properties of Equilateral Triangles:

* The Isosceles Triangle Theorem will apply to the equilateral triangle.
* Base angles are congruent.

Corollary:

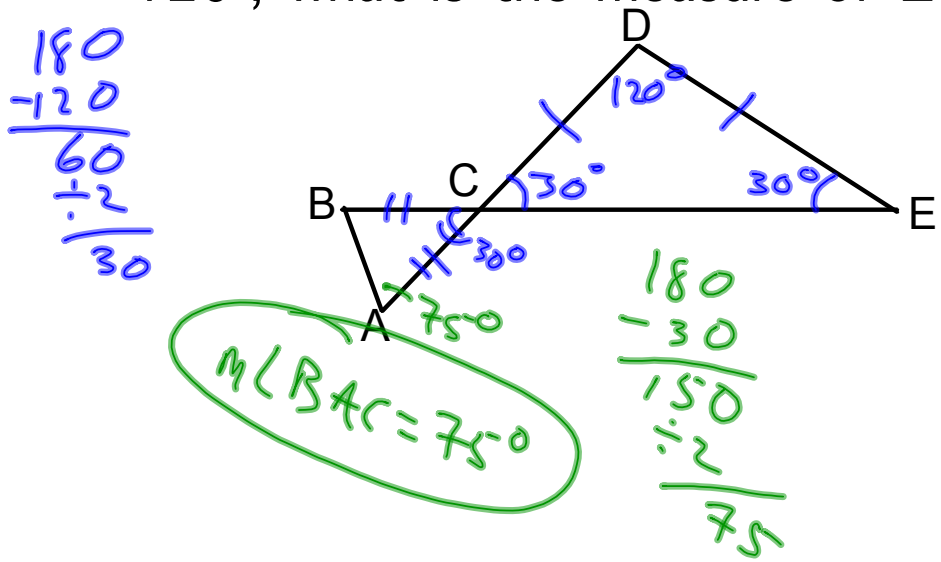
* A triangle is equilateral iff it is equiangular.

180 ÷ 3 = 60

Corollary:

* Each angle of an equilateral triangle is 60°.

1. If $\overline{DE} \cong \overline{CD}$, $\overline{BC} \cong \overline{AC}$, and $m\angle CDE = 120°$, what is the measure of $\angle BAC$?



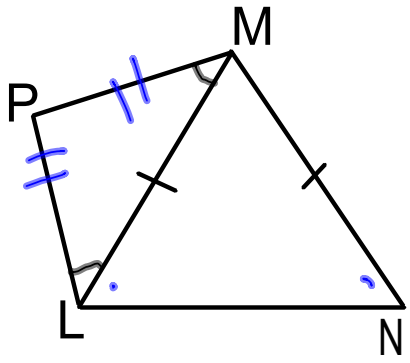
180 − 120 = 60; 60 ÷ 2 = 30

180 − 30 = 150; 150 ÷ 2 = 75

m∠BAC = 75°

2. a. Name 2 congruent angles. $\angle MLN \cong \angle MNL$

b. Name 2 congruent segments. $\overline{PL} \cong \overline{PM}$



3. Take the figure shown and Draw $\overline{EJ}$ so that $\overline{EJ}$ bisects $\angle 2$, and J lies on $\overline{FG}$.

ΔEFG is equilateral, $\overline{EH}$ bisects $\angle E$.

Find the following:

a. m $\measuredangle HEJ = 15^\circ$

b. m $\measuredangle EJH = 90 - 15 = 75^\circ$

c. m $\measuredangle EJG = 180 - 75 = 105^\circ$