Isosceles and Equilateral Triangles

Section 5.4

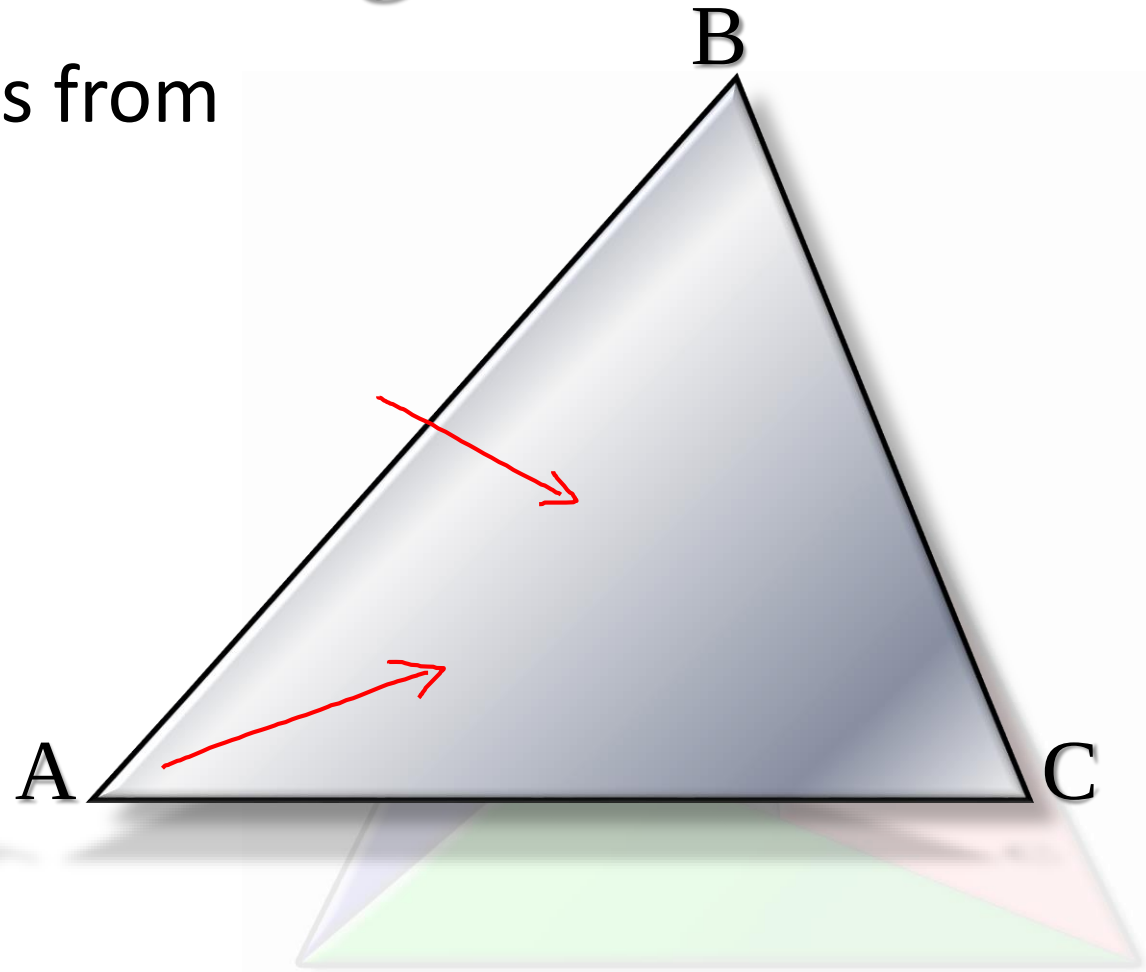
Triangles

- **Opposite** – Across from

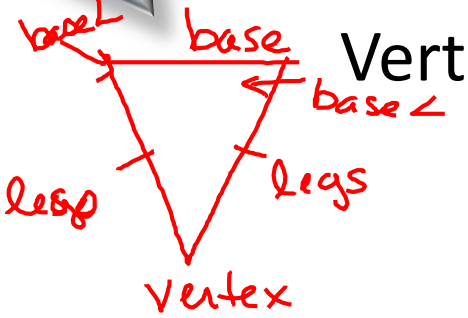
Example

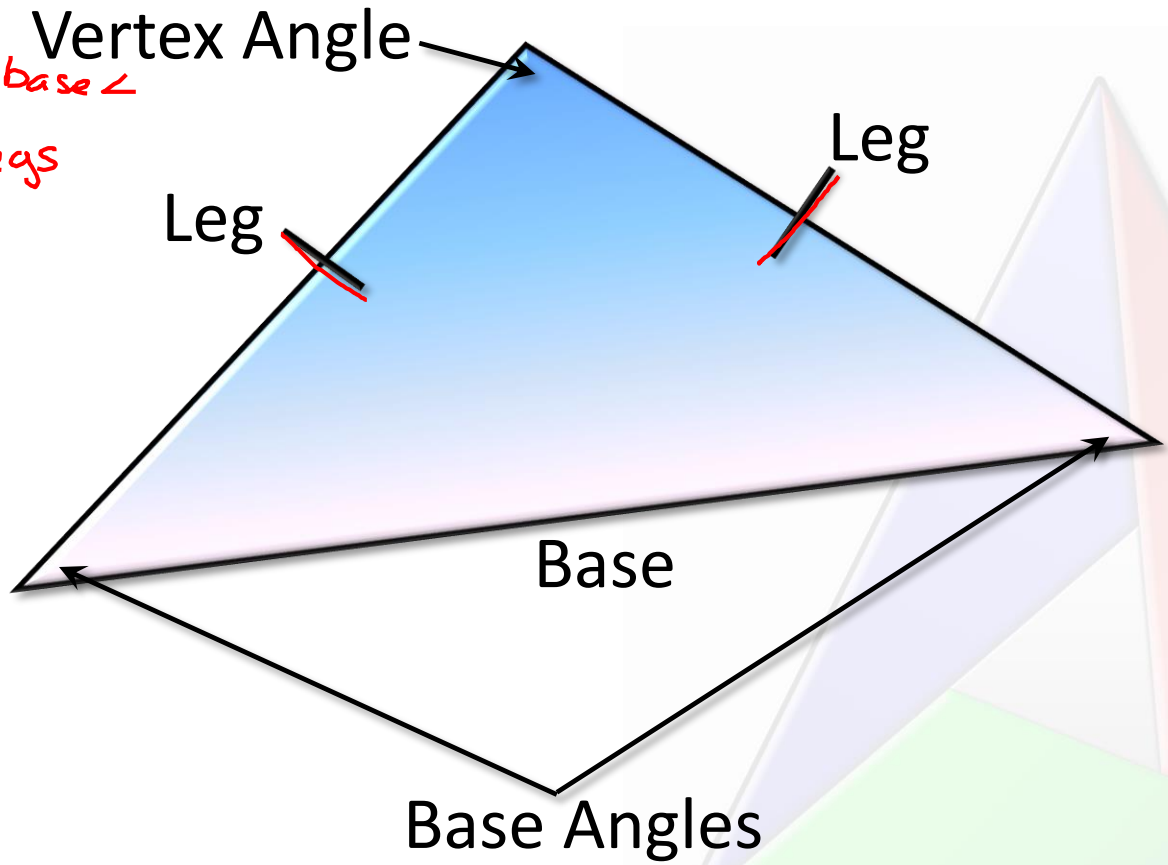
Side opposite $\angle A$ is $\overline{BC}$

Angle opposite $\overline{AB}$ is $\angle C$



Isosceles Triangle Anatomy

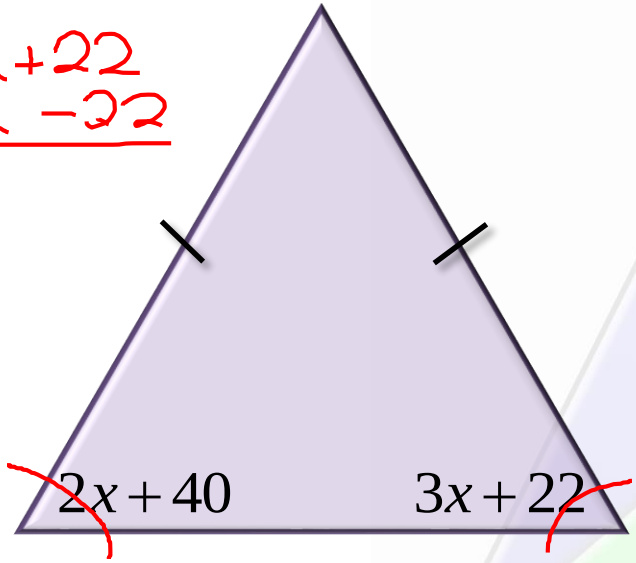




Base Angles Theorem

- If two sides of a triangle are congruent, then the angles opposite them are congruent.

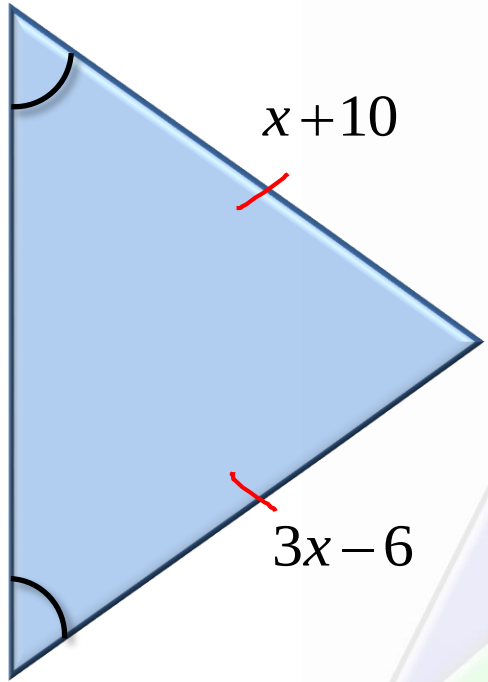
$$2x + 40 = 3x + 22$$
$$-2x \quad -22 \quad -2x \quad -22$$
$$18 = x$$



Converse of Base Angles Theorem

- The converse is also true!

$x+10 = 3x-6$
$-x+6 \quad -x+6$
$16 = 2x$
$8 = x$

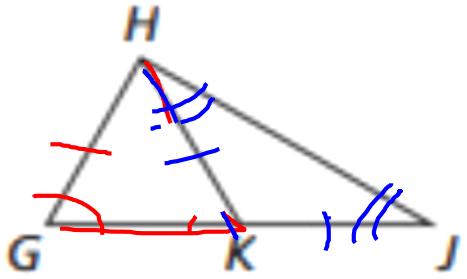


Example

Copy and complete the statement.

1. If $\overline{HG} \cong \overline{HK}$, then $\angle$ G $\cong \angle$ GKH

2. If $\angle KHJ \cong \angle KJH$, then $\overline{HK} \cong \overline{KJ}$.



Name what sides or angles must be congruent with the given information.

$\overline{NL} \cong \overline{SL}$

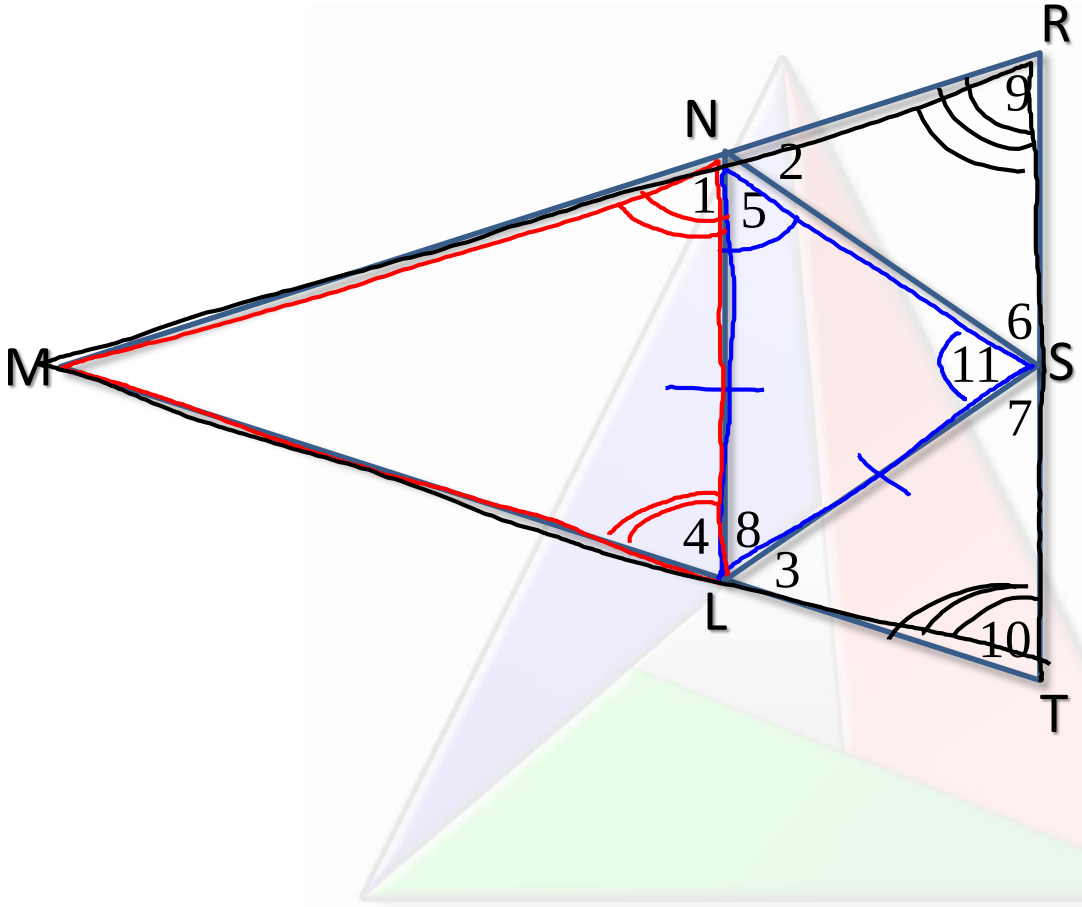
$\angle 5 \cong \angle 11$

$\angle 1 \cong \angle 4$

$\overline{MN} \cong \overline{ML}$

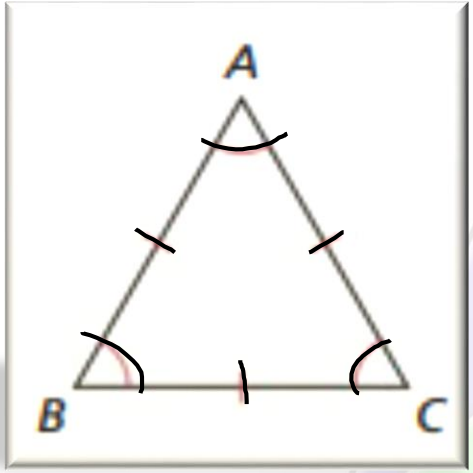
$\angle 9 \cong \angle 10$

$\overline{MR} \cong \overline{MT}$



Corollary to Base Angles Thm.

- If a triangle is equilateral, then the triangle is equiangular.
- The converse of this statement is also true.



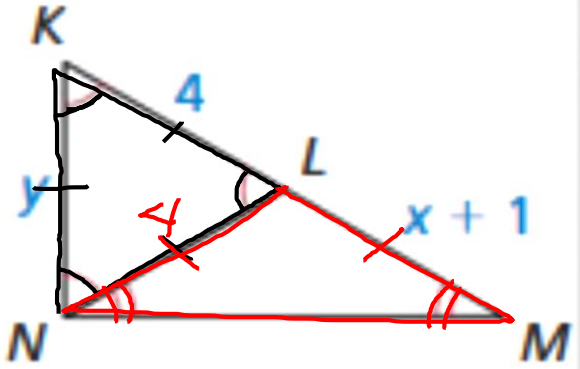
Example

Find the values of x and y in the diagram.

$y = 4$

$x + 1 = 4$

$x = 3$



Lesson 5.4 p.256; 3-16, 23-24, 42-44