

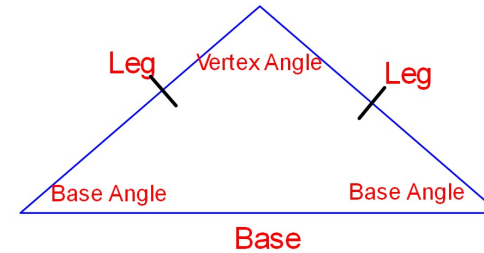
Sec 4-5: Isosceles and Equilateral Triangles

Isosceles: A triangle with at least two congruent sides

Equilateral: A triangle with all sides congruent

Isosceles Triangles

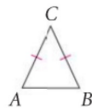
Legs $\rightarrow \cong$ sides
Base \rightarrow 3rd side



Theorem 4-3 Isosceles Triangle Theorem

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

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



Theorem 4-4 Converse of Isosceles Triangle Theorem

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

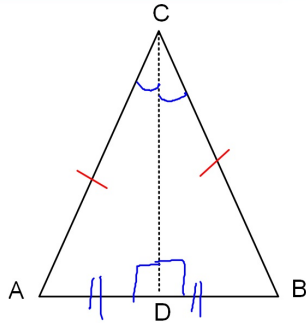
$$\overline{AC} \cong \overline{BC}$$



Theorem 4-5

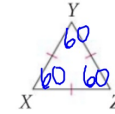
The bisector of the vertex angle of an isosceles triangle is the perpendicular bisector of the base.

$\overline{CD} \perp \overline{AB}$ and \overline{CD} bisects \overline{AB} .

**Corollary****Corollary to Theorem 4-3**

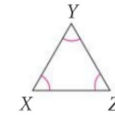
If a triangle is equilateral, then the triangle is equiangular.

$$\angle X \cong \angle Y \cong \angle Z$$

**Corollary****Corollary to Theorem 4-4**

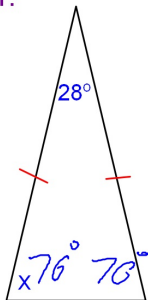
If a triangle is equiangular, then the triangle is equilateral.

$$\overline{XY} \cong \overline{YZ} \cong \overline{ZX}$$

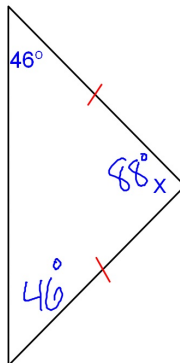


Find the value of x in each figure.

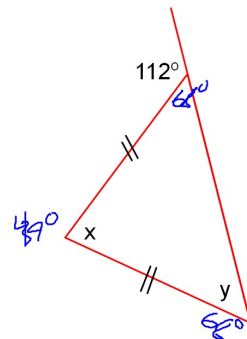
1.



2.

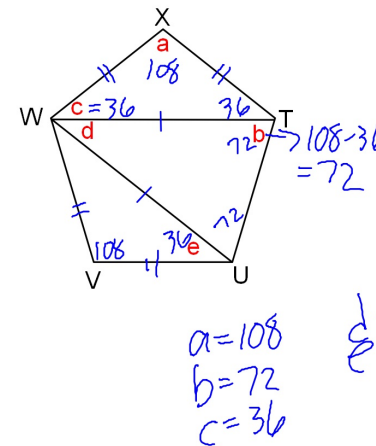


3. Find the value of x and y .

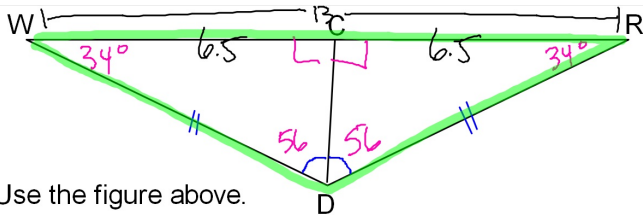


4. TUVWX is a regular pentagon. Find the value of

a , b , c , d , and e .



$$\begin{aligned} (n-2)180 \\ (5-2)180 \\ 3(180) = 540^\circ \\ \div 5 \\ 108^\circ \end{aligned}$$



5. Use the figure above.

a) If the measure of $\angle R = 34^\circ$ find the measure of all other angles.

b) If $WR = 13$ and the perimeter of $\triangle WRD = 43$ find the following:

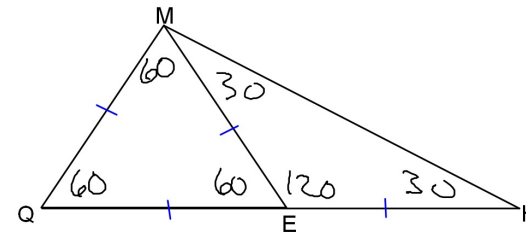
• $WD = 15$

• $RD = 15$

• $CR = 6.5$

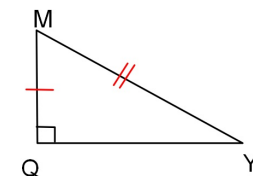
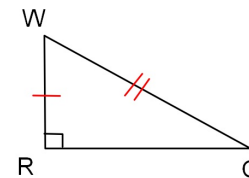
• $WC = 6.5$

6. Find the measure of $\angle HME$. 30°



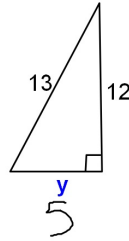
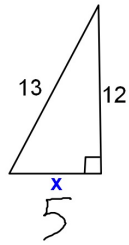
You can now finish Hwk #19

Are these triangles congruent?



The information suggests **SSA**
but there is no SSA theorem or postulate to show two triangles are congruent.

Find the value of x and y in each triangle.



$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 \text{leg}^2 + \text{leg}^2 &= \text{hyp}^2 \\
 12^2 + x^2 &= 13^2 \\
 144 + x^2 &= 169 \\
 -144 \quad -144 \\
 x^2 &= 25 \\
 x &= 5
 \end{aligned}$$

Using the Pythagorean Theorem you can show that if two corresponding sides of two right triangles are congruent the third pair of corresponding sides is also congruent.

Sec 4-6: Congruence in Right Triangles

HL Theorem

Theorem 4-6

Hypotenuse-Leg (HL) Theorem

If the hypotenuse and a leg of one right triangle are congruent to the hypotenuse and a leg of another right triangle, then the triangles are congruent.