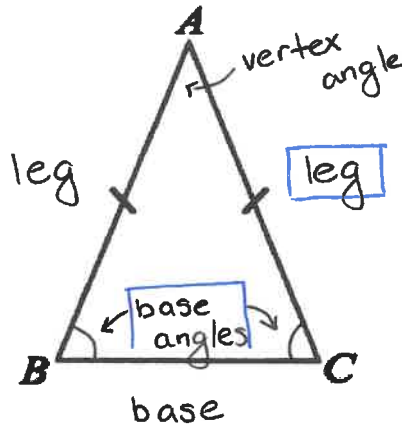


Isosceles Triangles



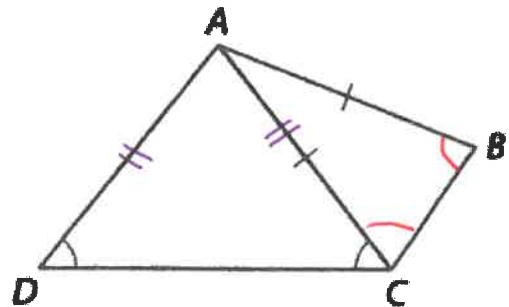
<p>Isosceles Triangle Theorem</p>	<p>If two sides of a triangle are congruent, then the <u>angles opposite those sides are congruent.</u></p>	<p>$\angle 1 \cong \angle 2$</p>
<p>Converse of Isosceles Triangle Theorem</p>	<p>If two angles of a triangle are congruent, then the <u>sides opposite to those angles are congruent.</u></p>	<p>$\overline{DE} \cong \overline{FE}$</p>

1. Use the diagram below to answer the following questions:

- a. Name two unmarked congruent angles.

$$\angle ACB \cong \angle B$$

Isosceles Δ
thm



- b. Name two unmarked congruent sides.

$$\overline{DA} \cong \overline{CA}$$

Converse of Isosceles
 Δ Thm

4.6 Isosceles and Equilateral Triangles

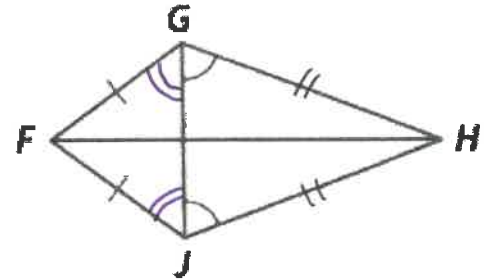
2. Use the diagram below to answer the following questions:

a. Name two unmarked congruent angles.

$$\angle FGJ \cong \angle FJG$$

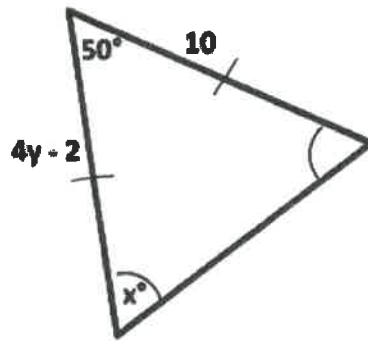
b. Name two unmarked congruent sides.

$$\overline{JH} \cong \overline{GH}$$



3. Solve for x and y

a.



$$50 + x + x = 180$$

$$50 + 2x = 180$$

$$2x = 130$$

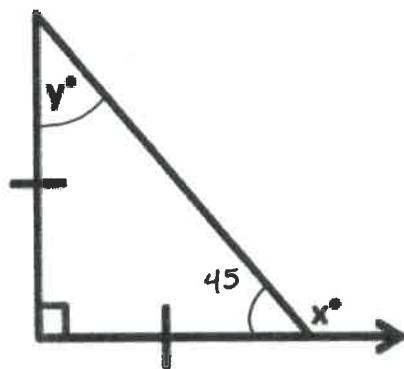
$$x = 65$$

$$4y - 2 = 10$$

$$4y = 12$$

$$y = 3$$

b.



$$90 + y + y = 180$$

$$90 + 2y = 180$$

$$2y = 90$$

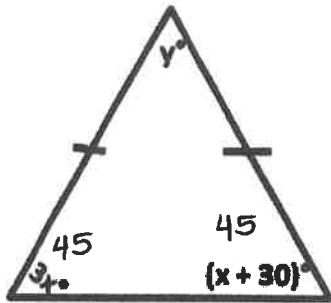
$$y = 45$$

$$180 - 45 = x$$

$$135^\circ = x$$

4.6 Isosceles and Equilateral Triangles

c.



Base Angles
 $3x = x + 30$

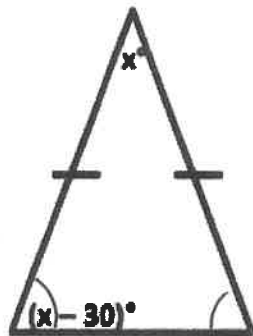
$$2x = 30$$

$$\boxed{x = 15}$$

$$y + 45 + 45 = 180$$

$$\boxed{y = 90}$$

d.



$$(x - 30) + (x - 30) + x = 180$$

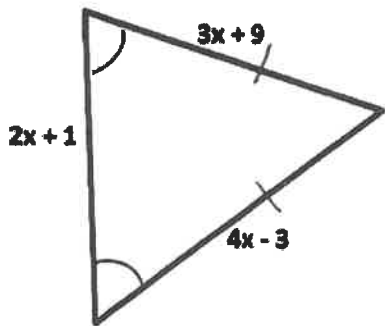
$$3x - 60 = 180$$

$$\begin{array}{r} +60 \\ +60 \end{array}$$

$$3x = 240$$

$$\boxed{x = 80}$$

4. Solve for x



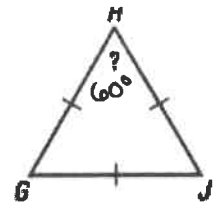
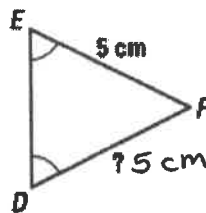
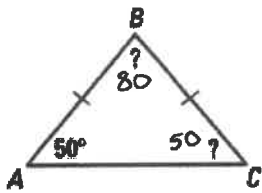
$$3x + 9 = 4x - 3$$

$$9 = x - 3$$

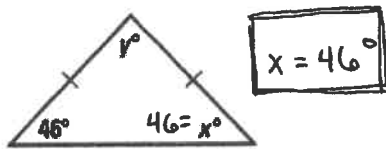
$$\boxed{12 = x}$$

Equilateral Triangle Corollaries		
	<p>A triangle is equilateral if and only if it is <u>equiangular</u>.</p> <p>all angles equal</p>	
	<p>Each angle of an equilateral triangle is 60°</p>	

5. Find the unknown measures:



6. Solve for x and y :

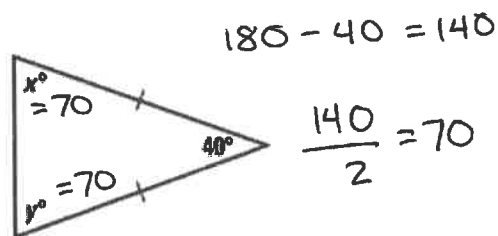


$x = 46^\circ$

$$46 + 46 + y = 180$$

$$92 + y = 180$$

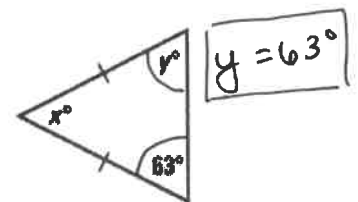
$y = 88$



$$180 - 40 = 140$$

$$\frac{140}{2} = 70$$

$x = y = 70$



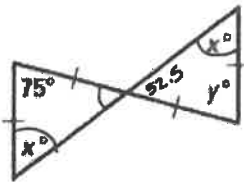
$y = 63^\circ$

$$63 + 63 + x = 180$$

$$126 + x = 180$$

$x = 54^\circ$

4.6 Isosceles and Equilateral Triangles

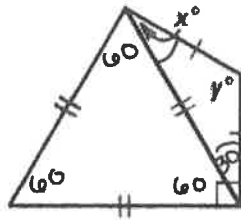


$$180 = 75 + x + x$$

$$105 = 2x$$

$$52.5 = x$$

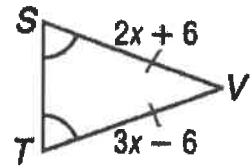
$$75 = y$$



$$x = 30^\circ$$

$$30 + 30 + y = 180$$

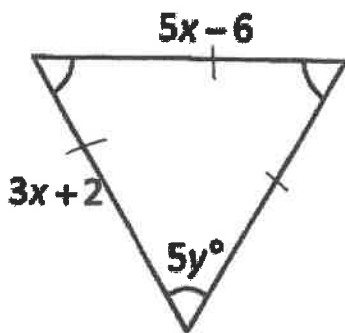
$$y = 120$$



$$2x + 6 = 3x - 6$$

$$2x + 12 = 3x$$

$$x = 12$$



$$3x + 2 = 5x - 6$$

$$3x = 5x - 8$$

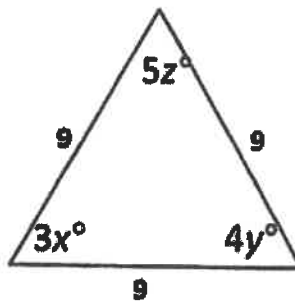
$$-5x = -5x$$

$$-2x = -8$$

$$x = 4$$

$$5y = 60$$

$$y = 12$$



$$3x = 60$$

$$x = 20$$

$$4y = 60$$

$$y = 15$$

$$5z = 60$$

$$z = 12$$

