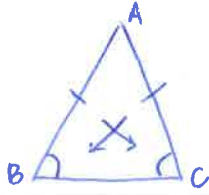
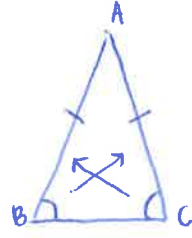
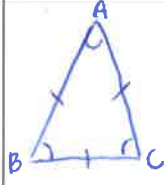
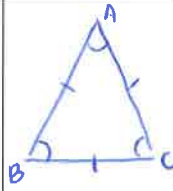




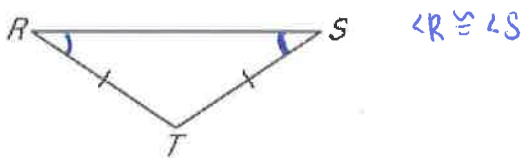
- I can use theorems about isosceles and equilateral triangles to solve problems.

First things first: Some theorems that will help you solve problems in this section.

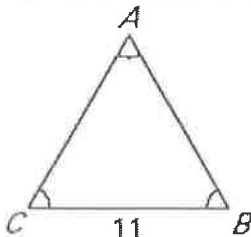
Theorem	Explanation	Picture
Base Angles Theorem	If two sides of a triangle are congruent, then the angles opposite them are congruent.	 <p>If $\overline{AB} \cong \overline{AC}$, then $\angle B \cong \angle C$</p>
Converse of the Base Angles Theorem	If two angles of a triangle are congruent, then the sides opposite them are congruent.	 <p>If $\angle B \cong \angle C$, then $\overline{AB} \cong \overline{AC}$</p>
Corollary of the Base Angles Theorem	If a triangle is equilateral, then it is equiangular.	 <p>If $\overline{AB} \cong \overline{BC} \cong \overline{AC}$, then $\angle A \cong \angle B \cong \angle C$</p>
Corollary to the converse of the Base Angles Theorem	If a triangle is equiangular, then it is equilateral.	 <p>If $\angle A \cong \angle B \cong \angle C$, then $\overline{AB} \cong \overline{BC} \cong \overline{AC}$</p>

Now let's try some examples:

- 1) In the diagram, $\overline{RT} \cong \overline{ST}$. Please name two congruent angles.



- 2) Find AC and AB in the triangle below.

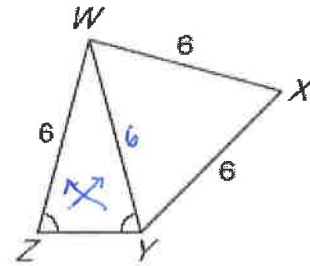


Since $\triangle ABC$ is equiangular, it is also equilateral so all sides have the same length
AC = 11 and AB = 11

Use the information in the diagram to find the missing values.

3) Find WY. = 6

Since ΔWZY is isosceles using the Base Angles converse Theorem

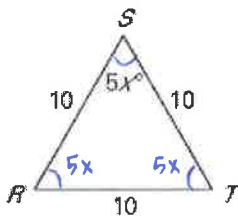


4) Find $m\angle WXY$. = 60°

Since ΔWXY is equilateral, it is also equiangular so each angle will have a measure of 60° .

Please solve for x.

5)



$$5x + 5x + 5x = 180$$

$$15x = 180$$

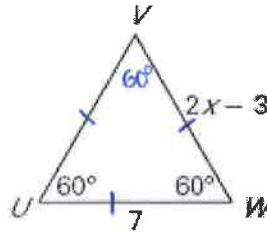
$$x = 12$$

or

$$5x = 60$$

$$x = 12$$

6)



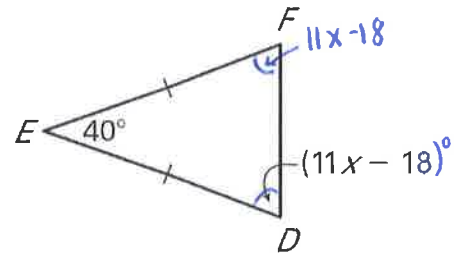
Since ΔUVW is equilateral, all sides are \cong , so:

$$7 = 2x - 3$$

$$10 = 2x$$

$$x = 10$$

7)



using Base Angles Thm,

$$m\angle F = m\angle D \text{ so } m\angle F = (11x - 18)^\circ$$

$$40 + 11x - 18 + 11x - 18 = 180 \text{ (}\Delta \text{ sum)}$$

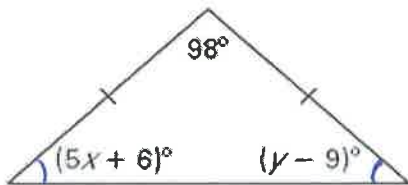
$$22x + 4 = 180$$

$$22x = 176$$

$$x = 8$$

Please find the values of x and y.

8)



(Δ sum Thm)

$$98 + 5x + 6 + y - 9 = 180$$

$$5x + y + 95 = 180$$

$$5x + y = 85$$

$$\begin{cases} 5x + y = 85 \\ 5x - y = -16 \end{cases}$$

$$10x = 70 \Rightarrow x = 7$$

(Base Angles Thm)

$$5x + 6 = y - 9$$

$$5x - y = -15$$

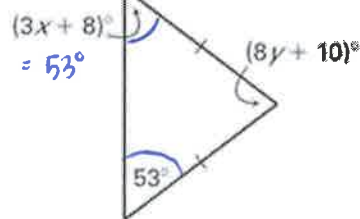
$$5(7) - y = -15$$

$$35 - y = -15$$

$$-y = -50$$

$$y = 50$$

9)



$$3x + 8 = 53 \text{ (Base Angles Thm)}$$

$$3x = 45$$

$$x = 15$$

$$53 + 53 + 8y + 10 = 180 \text{ (}\Delta \text{ sum)}$$

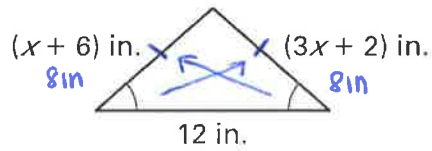
$$8y + 116 = 180$$

$$8y = 64$$

$$y = 8$$

Please find the perimeter of the triangle.

10)



Using Base Angles converse,

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

$$6 = 2x + 2$$

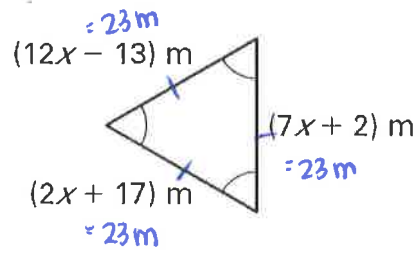
$$4 = 2x$$

$$\boxed{x = 2}$$

$$\text{Perimeter} = 8 + 8 + 12$$

$$\boxed{P = 28 \text{ in}}$$

11)



Since the Δ is equilateral, all sides are \cong

Pick 2 sides to set equal to each other:

$$2x + 17 = 7x + 2$$

$$17 = 5x + 2$$

$$15 = 5x$$

$$\boxed{x = 3}$$

$$\text{Perimeter} = 23 + 23 + 23$$

$$\boxed{P = 69 \text{ m}}$$