

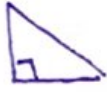





**Objectives:**

- I understand how to prove the Triangle Angle Sum theorem, Exterior Angle Theorem of a Triangle, the Isosceles Triangle theorem, and the Triangle Mid-segment Theorem.
- I can use these theorems to solve for missing variables.

**Vocabulary:**

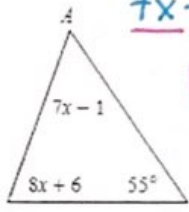
Triangle classification by angle measure			Triangle classification by number of congruent sides		
<b>Acute Triangle:</b> All interior angles of the triangle are less than $90^\circ$ 	<b>Obtuse Triangle:</b> One interior angle of the triangle is greater than $90^\circ$ 	<b>Right Triangle:</b> One interior angle of the triangle is equal to $90^\circ$ 	<b>Scalene Triangle:</b> None of the sides of the triangle are congruent 	<b>Isosceles Triangle:</b> Two sides of the triangle are congruent 	<b>Equilateral Triangle:</b> All three sides of the triangle are congruent 

**Angle Sum Theorem:**

- All angles of a triangle add up to be  $180^\circ$

**Examples:**

Solve for x.



$$7x - 1 + 8x + 6 + 55 = 180$$

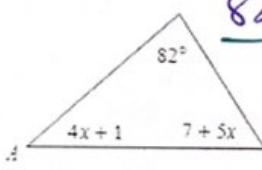
$$15x + 60 = 180$$

$$\quad -60 \quad -60$$

$$\frac{15x}{15} = \frac{120}{15}$$

$$\boxed{x = 8}$$

Solve for x, then find the measure of angle A.



$$82 + 4x + 1 + 7 + 5x = 180$$

$$90 + 9x = 180$$

$$\quad -90 \quad -90$$

$$\frac{9x}{9} = \frac{90}{9}$$

$$m\angle A = 4(10) + 1$$

$$\boxed{m\angle A = 41^\circ}$$

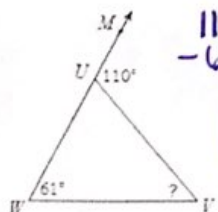
$$\boxed{x = 10}$$

**Exterior Angle Theorem:**

- If an exterior angle of a triangle forms a linear pair with an interior angle, the exterior angle will be equal to the sum of the other two angles.

**Examples:**

Find the measure of the missing angle

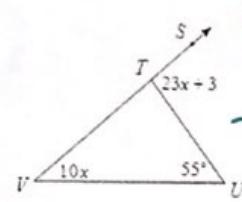


$$110 = 61 + 7$$

$$\quad -61 \quad -61$$

$$\boxed{V = 49}$$

Solve for x



$$23x + 3 = 10x + 55$$

$$\quad -3 \quad -3$$

$$23x = 10x + 52$$

$$\quad -10x \quad -10x$$

$$\frac{13x}{13} = \frac{52}{13}$$

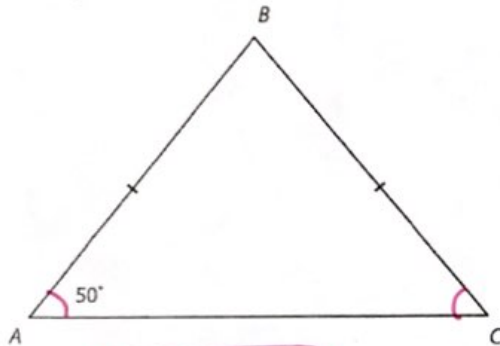
$$\boxed{x = 4}$$

**Isosceles Triangle Theorem:**

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

**Examples:**

Find angle B and C

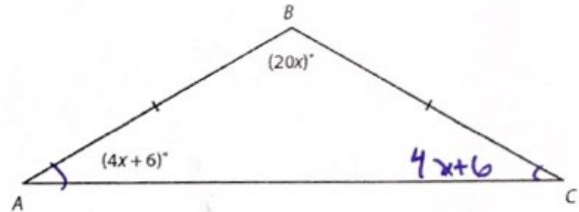


$$\angle C = 50^\circ$$

$$180 - 50 - 50 = 80$$

$$m\angle B = 80^\circ$$

Find x, and the measure of angle A and B



$$4x+6 + 4x+6 + 20x = 180$$

$$12 + 28x = 180$$

$$-12 \quad -12$$

$$28x = 168$$

$$\frac{28x}{28} = \frac{168}{28}$$

$$x = 6$$

$$m\angle A = 4(6) + 6$$

$$m\angle A = 30^\circ$$

$$m\angle B = 20(6)$$

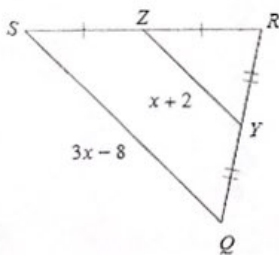
$$m\angle B = 120^\circ$$

**Triangle Midsegment Theorem:**

- If a line is drawn from the midpoint of one side of a triangle to another it will be parallel to the line it does not touch. It will also be exactly half the length of the line it does not touch.

**Examples:**

Solve for x



$$2(x+2) = 3x-8$$

$$2x+4 = 3x-8$$

$$-4 \quad -4$$

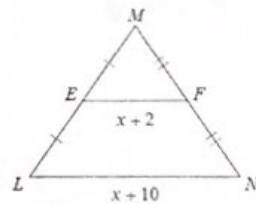
$$2x = 3x-12$$

$$-2x \quad -2x$$

$$-x = -12$$

$$x = 12$$

Solve for x



$$2(x+2) = x+10$$

$$2x+4 = x+10$$

$$-x \quad -x$$

$$x+4 = 10$$

$$-4 \quad -4$$

$$x = 6$$