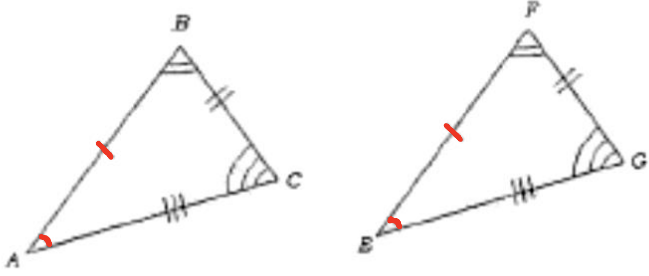


➤ **Review:** **Similar triangles** are the **SAME SHAPE** but **DIFFERENT SIZES**. In order for **two triangles to be similar**, the **corresponding angles must be congruent** and the **corresponding sides must be proportional**.

➤ **Congruent Triangles:** Triangles that are the same shape and the same size.

▪ Each triangle has three congruent sides and three congruent angles.

▪ If **all SIX** of the corresponding parts of two triangles are congruent, then the triangles are congruent.



Congruent Triangles: $\triangle ABC \cong \triangle EFG$

Corresponding Congruent Angles:
 $\angle A \cong \angle E$ $\angle B \cong \angle F$ $\angle C \cong \angle G$

Corresponding Congruent Sides:
 $\overline{AB} \cong \overline{EF}$ $\overline{BC} \cong \overline{FG}$ $\overline{AC} \cong \overline{EG}$

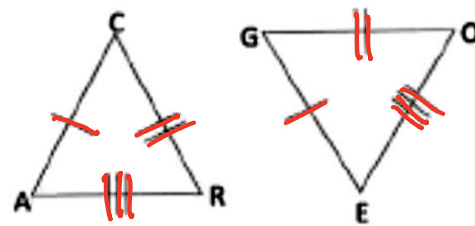
➤ **Definition of Congruent Triangles (CPCTC):**

▪ Two triangles are congruent if and only if their corresponding parts are congruent.

▪ **CPCTC** – **Corresponding Parts of Congruent Triangles are Congruent**

1. Write a **congruency statement** for the two triangles at right.

$$\triangle ACR \cong \triangle EGO$$



2. List ALL of the congruent parts if $\triangle EFG \cong \triangle HGF$.

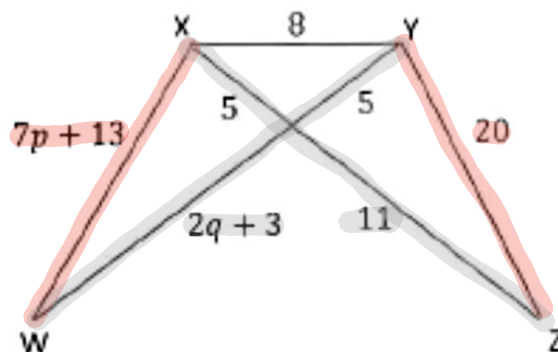
Angles:
 $\angle E \cong \angle H$
 $\angle F \cong \angle G$
 $\angle G \cong \angle F$

Sides:
 $\overline{EF} \cong \overline{HG}$
 $\overline{FG} \cong \overline{GF}$
 $\overline{EG} \cong \overline{HF}$

3. $\triangle WXY \cong \triangle ZYX$ Solve for p and q.

$$\begin{array}{r} 7p + 13 = 20 \\ -13 \quad -13 \\ \hline 7p = 7 \\ \frac{7p}{7} = \frac{7}{7} \\ \hline p = 1 \end{array}$$

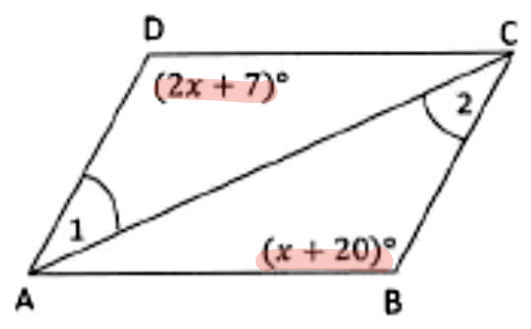
$$\begin{array}{r} 2q + 3 = 11 \\ -3 \quad -3 \\ \hline 2q = 8 \\ \frac{2q}{2} = \frac{8}{2} \\ \hline q = 4 \end{array}$$



4. $\triangle ADC \cong \triangle CBA$ ^{1st} Solve for x Then ^{2nd} find the $m\angle B$ & $m\angle D$

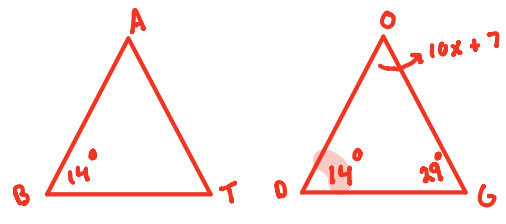
$$\begin{array}{r} 2x+7 = x+20 \\ -x \quad -x \\ \hline x+7 = 20 \\ -7 \quad -7 \\ \hline \textcircled{1} \quad x = 13 \end{array}$$

$$\begin{aligned} m\angle B &= 13 + 20 = 33^\circ \\ m\angle D &= 33^\circ \leftarrow (2(13)+7) \end{aligned}$$



➤ Draw and label a diagram. Solve for the missing variable(s).

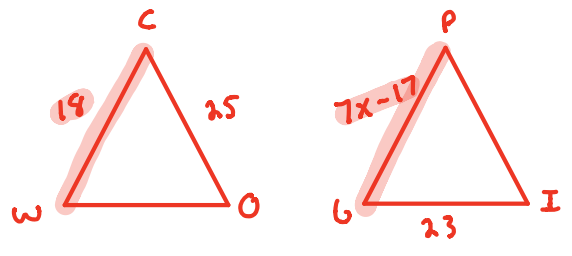
5. If $\triangle BAT \cong \triangle DOG$, and $m\angle B = 14^\circ$, $m\angle G = 29^\circ$ and $m\angle O = (10x + 7)^\circ$, find x and $m\angle O$.



$$\begin{aligned} 10x+7 + 14 + 29 &= 180^\circ \\ 10x + 50 &= 180^\circ \\ -50 \quad -50 \\ \hline 10x &= 130 \\ \frac{10x}{10} &= \frac{130}{10} \quad \textcircled{1} \quad x = 13 \end{aligned}$$

$$\begin{aligned} m\angle O &= 10(13) + 7 \\ \textcircled{2} &= 137^\circ \end{aligned}$$

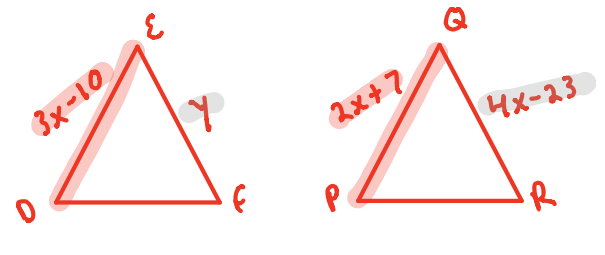
6. If $\triangle COW \cong \triangle PIG$, and $CO = 25$, $CW = 18$, $IG = 23$ and $PG = 7x - 17$, find x and PG .



$$\begin{aligned} 7x - 17 &= 18 \\ +17 \quad +17 \\ \hline 7x &= 35 \\ \frac{7x}{7} &= \frac{35}{7} \\ \textcircled{1} \quad x &= 5 \end{aligned}$$

$$\begin{aligned} PG &= 7(5) - 17 \\ &= 19 \quad \textcircled{2} \end{aligned}$$

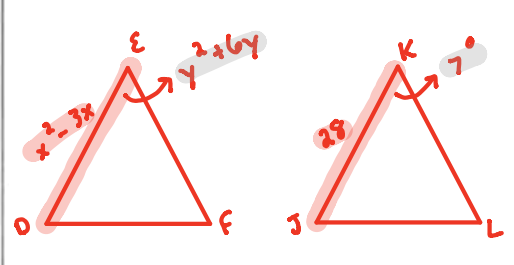
7. If $\triangle DEF \cong \triangle PQR$ and $DE = 3x - 10$, $QR = 4x - 23$, $PQ = 2x + 7$ and $EF = y$, find x and y .



$$\begin{aligned} 3x - 10 &= 2x + 7 \\ -2x \quad -2x \\ \hline x - 10 &= 7 \\ +10 \quad +10 \\ \hline x &= 17 \end{aligned}$$

$$\begin{aligned} 4(17) - 23 &= y \\ y &= 45 \end{aligned}$$

8. If $\triangle DEF \cong \triangle JKL$ and $DE = x^2 - 3x$, $KJ = 28$, $m\angle E = (y^2 + 6y)^\circ$ and $m\angle K = 7^\circ$, find x and y .



$$\begin{aligned} x^2 - 3x &= 28 \\ -28 \quad -28 \\ \hline x^2 - 3x - 28 &= 0 \\ -7 \quad 4 &\rightarrow \text{change signs} \\ -7 \quad -4 &\rightarrow \text{change signs} \\ \hline x &= 7 \quad x = -4 \end{aligned}$$

$$\begin{aligned} y^2 + 6y &= 7 \\ -7 \quad -7 \\ \hline y^2 + 6y - 7 &= 0 \\ -7 \quad 7 &\rightarrow \text{change signs} \\ -1 \quad 7 &\rightarrow \text{change signs} \\ \hline y &= 1 \quad y = -7 \\ (1)^2 + 6(1) &= 7 \\ 7 &= 7 \end{aligned}$$

Unit 4B Day 1 CW/HW

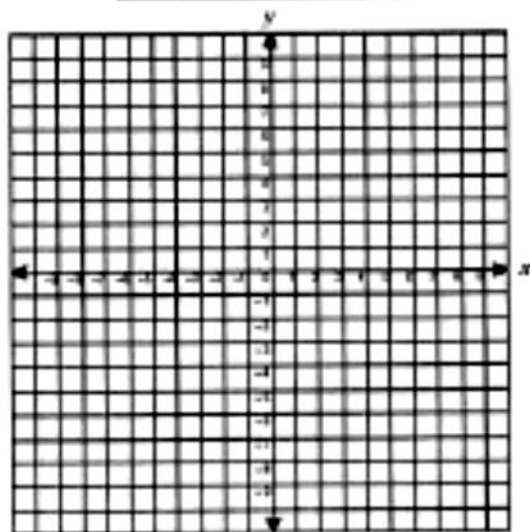
➤ $\triangle PQR \cong \triangle ABC$

➤ Find the values of x and y

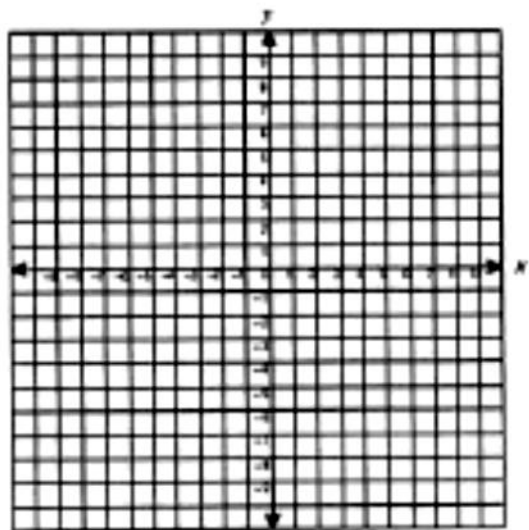
<p>Given:</p> <p>1. $m\angle R = (5x + 70)^\circ$ $QR = 4y + 2$ $m\angle C = (24x - 25)^\circ$ $BC = x + y$</p>	<p>Given:</p> <p>2. $m\angle R = (90 - y)^\circ$ $PR = 3x + y - 1$ $m\angle C = 13^\circ$ $AC = 32 - x$</p>
<p>Given:</p> <p>3. $PQ = 5x - 31$ $AB = x + 1$ $QR = -3y - 1$ $BC = 9 - y$</p>	<p>Given:</p> <p>4. $m\angle A = (15y - 3)^\circ$ $PQ = 11 - x$ $m\angle P = (43 - x)^\circ$ $AB = 3y + 1$</p>
<p>Given:</p> <p>5. $AB = 2x + 1$ $PQ = x + 7$ $QR = 4y + 3$ $BC = 2y + 11$</p>	<p>Given:</p> <p>6. $m\angle P = (3x + 10)^\circ$ $m\angle Q = (3x)^\circ$ $m\angle A = (x + 20)^\circ$ $m\angle B = (x + 46)^\circ$</p> <p>Find the $m\angle P$ and the $m\angle Q$.</p>

7. Graph each line.
Identify two congruent triangles formed by the lines.
Label as $\triangle ABC$ and as $\triangle DEF$.

$$\begin{array}{l} x = 0 \quad x = 4 \\ y = 0 \quad y = 2x - 4 \end{array}$$

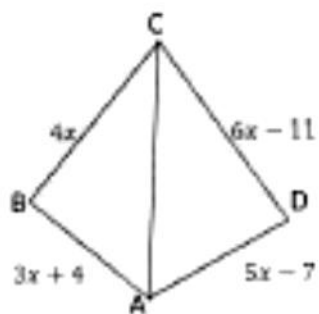


8. Consider 2 triangles, $\triangle ABC$ and $\triangle FDE$, with vertices
 $A: (0, 7) B: (-4, 0) C: (0, 0) D: (2, 3) E: (2, -1) F: (9, -1)$.
Draw a diagram and then state the corresponding congruent parts for the two triangles.



➤ Solve

9. The perimeter of $ABCD$ is 85.
If $\triangle ABC \cong \triangle ADC$, find the value of x .



10. Given: $\triangle NEW \cong \triangle CAR$
 $NE = 11$ $AR = 4y - 12$ $NW = x + y$
 $EW = 10$ $CA = 4x + 3$

Solve for x , y and CR .