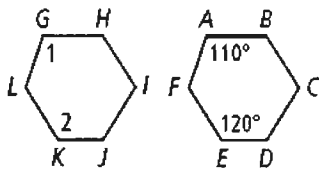


4.2 – Congruent Figures

Each pair of polygons is congruent. Find the measures of the numbered angles.

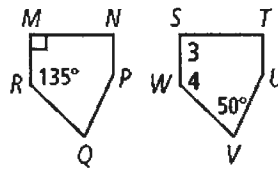
1)



$$m\angle 1 = 110^\circ$$

$$m\angle 2 = 120^\circ$$

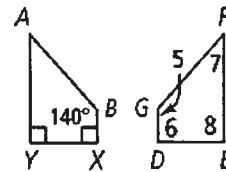
2)



$$m\angle 3 = 90^\circ$$

$$m\angle 4 = 135^\circ$$

3)



$$m\angle 5 = 140^\circ$$

$$m\angle 6 = 90^\circ$$

$$m\angle 7 = 40^\circ$$

$$m\angle 8 = 90^\circ$$

$\triangle CAT \cong \triangle JSD$. List each of the following.

4) Three pairs of congruent sides

$$\overline{CA} \cong \overline{JS}$$

$$\overline{AT} \cong \overline{SD}$$

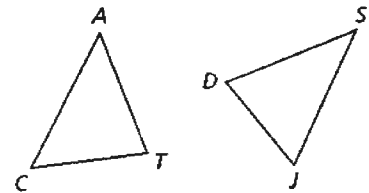
$$\overline{CT} \cong \overline{JD}$$

5) Three pairs of congruent angles

$$\angle C \cong \angle J$$

$$\angle A \cong \angle S$$

$$\angle T \cong \angle D$$



$WXYZ \cong JKLM$. List each of the following.

6) Four pairs of congruent sides

$$\overline{WZ} \cong \overline{JM}$$

$$\overline{WX} \cong \overline{JK}$$

$$\overline{XY} \cong \overline{KL}$$

$$\overline{ZY} \cong \overline{ML}$$

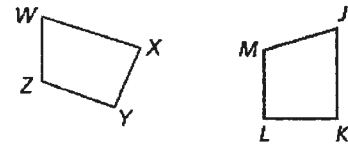
7) Four pairs of congruent angles

$$\angle W \cong \angle J$$

$$\angle X \cong \angle K$$

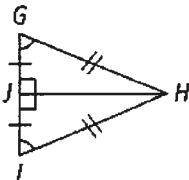
$$\angle Y \cong \angle L$$

$$\angle Z \cong \angle M$$



For #8-10, can you conclude that the triangles are congruent? Justify your answers.

8) $\triangle GHJ$ and $\triangle IHJ$



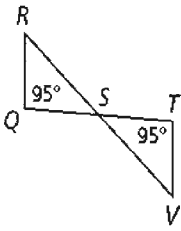
$$\overline{GJ} \cong \overline{IJ} \text{ (Given)}, \overline{GH} \cong \overline{IH} \text{ (Given)}, \overline{JH} \cong \overline{JH} \text{ (Reflexive Prop)}$$

$$\angle G \cong \angle I \text{ (Given)}, \angle GHJ \cong \angle IJH \text{ (Both right angles)}$$

$$\angle GHJ \cong \angle IJH \text{ (Third Angle Theorem)}$$

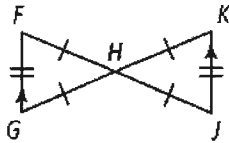
Yes. All parts of the \triangle s are \cong , \therefore the triangles must be \cong

9) $\triangle QRS$ and $\triangle TVS$



$\angle Q \cong \angle T$ (Both 95°), $\angle RSQ \cong \angle VST$ (Vertical Angles)
 $\angle R \cong \angle V$ (Third Angle theorem).
 However, no measurements of the sides are given
 and we can't conclude any corresponding sides are \cong .
 There is not enough info to conclude that the triangles
 are \cong .

10) $\triangle FGH$ and $\triangle JKH$

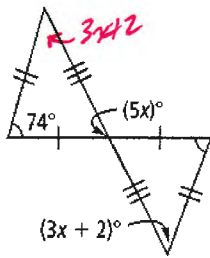


$\overline{GF} \cong \overline{KH}$ (given), $\overline{FH} \cong \overline{JH}$ (given), $\overline{GH} \cong \overline{KH}$ (given)
 $\angle F \cong \angle J$ (AIA), $\angle G \cong \angle K$ (AIA), $\angle FHG \cong \angle JHK$
 (Vertical Angles)

Yes, All parts of the \triangle s are \cong , \therefore the \triangle s must be \cong .

Find the values of the variables.

11)



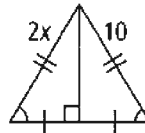
$$5x + (3x + 2) + 74 = 180$$

$$8x + 76 = 180$$

$$8x = 104$$

$$\boxed{x = 13}$$

12)



$$2x = 10$$

$$\boxed{x = 5}$$

$ABCD \cong FGHI$. Find the measures of the given angles or lengths of the given sides.

13) $m\angle C = 5z + 20$, $m\angle H = 6z + 10$

$$5z + 20 = 6z + 10$$

$$10 = z$$

$$\boxed{m\angle C = m\angle H = 70^\circ}$$

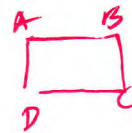
14) $AD = 5b + 4$; $FJ = 3b + 8$

$$5b + 4 = 3b + 8$$

$$2b = 4$$

$$b = 2$$

$$\boxed{AD = FJ = 14}$$



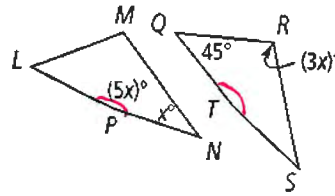
15) $LMNP \cong QRST$. Find the value of x .

$$5x + x + 3x + 45 = 360$$

$$9x + 45 = 360$$

$$9x = 315$$

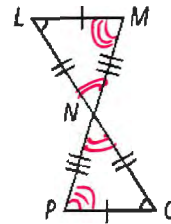
$$x = 35^\circ$$



Complete the following proof.

16) Given: (All information from the diagram)

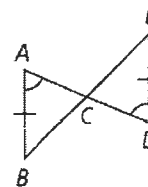
Prove: $\triangle LNM \cong \triangle QNP$



Statement	Reasons
1. $\angle L \cong \angle Q$	Given
2. $\angle LNM \cong \angle QNP$	VA
3. $\angle M \cong \angle P$	Third Angle Theorem
4. $\overline{LM} \cong \overline{QP}, \overline{LN} \cong \overline{QN}, \overline{MN} \cong \overline{PN}$	Given
5. $\triangle LNM \cong \triangle QNP$	Def of \cong Δ s (or CPCTC)

17) Given: \overline{AD} and \overline{BE} bisect each other.
 $\overline{AB} \cong \overline{DE}; \angle A \cong \angle D$

Prove: $\triangle ACB \cong \triangle DCE$



Statement	Reasons
1. \overline{AD} and \overline{BE} bisect each other. $\overline{AB} \cong \overline{DE}, \angle A \cong \angle D$	Given
2. $\overline{AC} \cong \overline{CD}, \overline{BC} \cong \overline{CE}$	Def. of bisectors
3. $\angle ACB \cong \angle DCE$	VA
4. $\angle B \cong \angle E$	Third Angle Theorem
5. $\triangle ACB \cong \triangle DCE$	Def. of \cong Δ s (or CPCTC)