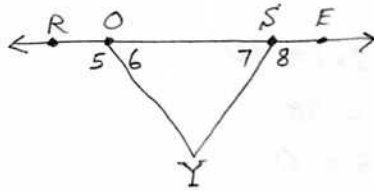


§2.4 #8, 10, 12, 15, 17, 21

8. Given: Diagram
 $\angle 6 \cong \angle 7$
Prove: $\angle 5 \cong \angle 8$

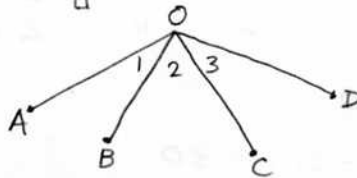


1. Diagram
2. $\angle 5$ supp. $\angle 6$
3. $\angle 7$ supp. $\angle 8$
4. $\angle 6 \cong \angle 7$
5. $\angle 5 \cong \angle 8$

1. G
2. Diag. (assumed from diagram)
3. "
4. G
5. Supps. of $\cong \angle$ s are $\cong$

□

10. Given: $\overleftrightarrow{OA} \perp \overleftrightarrow{OC}$
 $\overleftrightarrow{OB} \perp \overleftrightarrow{OD}$
Prove: $\angle 1 \cong \angle 3$



1. $\overleftrightarrow{OA} \perp \overleftrightarrow{OC}$
2. $\angle AOC$ is right
3. $\angle AOC = 90^\circ$
4. $\angle 1$ comp. $\angle 2$
5. $\overleftrightarrow{OB} \perp \overleftrightarrow{OD}$
6. $\angle BOD$ is right
7. $\angle BOD = 90^\circ$
8. $\angle 2$ comp. $\angle 3$
9. $\angle 1 \cong \angle 3$

1. G
2. Def. $\perp$
3. Def. rt. $\angle$
4. Def. comp. ($\angle$ s add to 90°)
5. G
6. Def. $\perp$
7. Def. rt. $\angle$
8. Def. comp.
9. Comps. of the same $\angle$ are $\cong$

□

Note: Mr. Hansen will henceforth treat steps 2, 3, 6, and 7 as optional in proofs of this type.

12. Let $x =$ measure of unknown $\angle$
 $90 - x =$ " " " $\angle$'s comp.
 $180 - x =$ " " " $\angle$'s supp.

$$180 - x = 3(90 - x) + 10$$

$$180 - x = 270 - 3x + 10$$

$$2x = 100$$

$$x = 50 \Rightarrow 90 - x = \text{comp.} = \textcircled{40}$$

Given: $\overline{PQ} \perp \overline{QR}$

$$m\angle PQS = x^2 + 12$$

$$m\angle SQR = 43 - 2x$$

$$(x^2 + 12) + (43 - 2x) = 90$$

$$x^2 - 2x + 55 = 90$$

$$x^2 - 2x - 35 = 0$$

$$(x + 5)(x - 7) = 0$$

$$x+5=0 \quad \text{or} \quad x-7=0$$

$$x = -5 \quad \text{or} \quad x = 7$$

$$x = -5 \text{ or } x = 7$$

$$m\angle PQS = x^2 + 12 = (-5)^2 + 12 = \boxed{37} \text{ or } (7)^2 + 12 = \boxed{61}$$

17. Note: "trisecting a rt. $\angle$ " means 30° .

Let $x =$ measure of unknown $\angle$
 " " " "
 $\angle$

$90 - x =$ " " " $\angle$'s comp.

$90 - x =$ " " " $\angle$'s supp.
 $180 - x =$

$$7(90-x) - 3(180-x) = 30$$

$$630 - 7x - (540 - 3x) = 30$$

$$630 - 7x - 540 + 3x = 30$$

$$-4x = -60$$

$$x = 15 \Rightarrow 180^\circ - x^\circ = 165^\circ$$

21. Let $x =$ measure of unknown $\angle$
 $90 - x =$ " " " $\angle$'s comp.
 $180 - x =$ " " " $\angle$'s supp.

$$\begin{aligned}90 - x &= \text{" " " L's supp.}\\180 - x &= \text{" " "}\end{aligned}$$

Given: $\frac{x}{180-x} = \frac{3}{7}$

Cross-multiply to get

$$7x = 3(180 - x)$$

$$7x = 540 - 3x$$

$$10x = 540$$

$$x = 54 \Rightarrow 90 - x = 36$$

$$\therefore \frac{\text{angle}}{\text{comp.}} = \frac{54}{36} = \left(\frac{3}{2} \text{ or } 3:2 \right)$$