

1. In the figure, point A is on the bisector of  $\angle XYZ$ . If  $AX = 2$  cm then find  $AZ$ .

**Given:** Point A is on the bisector of  $\angle XYZ$

$$AX = 2 \text{ cm}$$

**To find:**  $AZ$

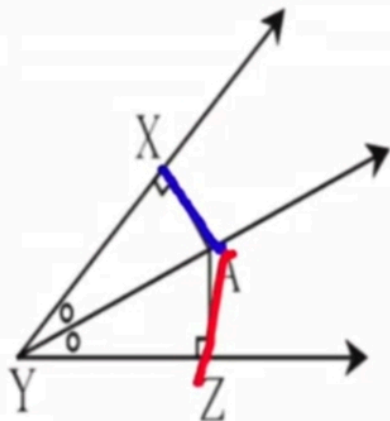
**Solution:** Point A is on the bisector of  $\angle XYZ$

$\therefore$  A is equidistant from the sides of  $\angle XYZ$

(Angle bisector theorem)

$$\therefore AX = AZ \quad \dots\dots\dots (AX = 2 \text{ cm given})$$

$$\therefore AZ = 2 \text{ cm}$$



2) In the figure,  $\angle RST = 56^\circ$ , seg  $PT \perp$  ray  $ST$ , seg  $PR \perp$  ray  $SR$  and seg  $PR \cong$  seg  $PT$ . Find the measure of  $\angle RSP$ . State the reason for your answer.

**Given:**  $\angle RST = 56^\circ$

Seg  $PT \perp$  ray  $ST$

seg  $PR \perp$  ray  $SR$

seg  $PR \cong$  seg  $PT$

**To Find :** Measure of  $\angle RSP$

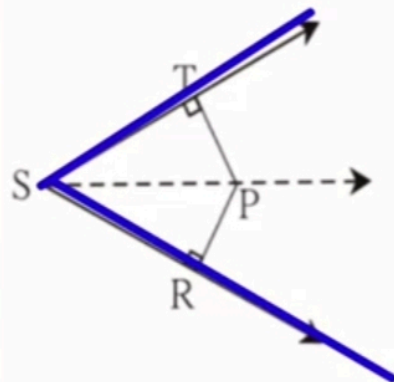
**Solution:** P is at equidistant from both sides of  $\angle RST$

Ray  $PS$  is a bisector of  $\angle RST$ .

$$\therefore \angle RSP = \frac{1}{2} \angle RST$$

$$= \frac{1}{2} \times 56^\circ \dots\dots\dots(\text{given})$$

$$\therefore \angle RSP = 28^\circ$$



3) In  $\triangle PQR$ ,  $PQ = 10$  cm,  $QR = 12$  cm,  $PR = 8$  cm. Find out the greatest and smallest angle of the triangle.

**Solution:** In  $\triangle PQR$ ,

$$PQ = 10 \text{ cm}$$

$$QR = 12 \text{ cm}$$

$$PR = 8 \text{ cm.}$$

$$\therefore QR > PQ > PR$$

$$\therefore \angle P > \angle R > \angle Q$$

$\therefore \angle P$  is greatest angle .....

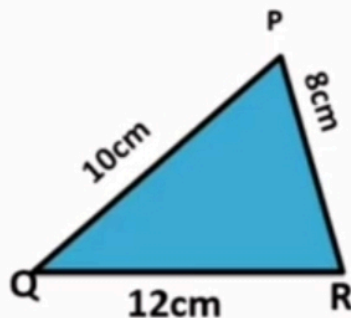
(Angle opposite to greatest side is greater)

$\therefore \angle Q$  is smallest angle .....

(Angle opposite to smallest side is smaller)

**Given**

$$12 > 10 > 8$$



4) In  $\triangle FAN$ ,  $\angle F = 80^\circ$ ,  $\angle A = 40^\circ$ . Find out the greatest and the smallest side of the triangle. State the reason.

**Solution:** In  $\triangle FAN$ ,

**Sum of measure of all angles of triangle is  $180^\circ$**

$$\angle F + \angle A + \angle N = 180^\circ$$

$$\therefore 80^\circ + 40^\circ + \angle N = 180^\circ$$

$$\therefore 120^\circ + \angle N = 180^\circ$$

$$\therefore \angle N = 180^\circ - 120^\circ$$

$$\therefore \angle N = 60^\circ$$

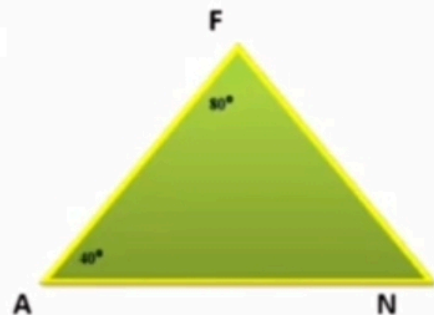
$$80^\circ > 60^\circ > 40^\circ$$

$$\angle F > \angle N > \angle A$$

$$AN > FA > FN$$

**AN** is the greatest side of the triangle.

**FN** is the smallest side of the triangle.



5) Prove that an equilateral triangle is equiangular.

**Given:** In  $\Delta PQR$ ,

$$PQ = QR = PR$$

**To prove:**  $\angle P \cong \angle Q \cong \angle R$

**Proof:** In  $\Delta PQR$

seg  $PQ \cong$  seg  $PR$  (given)

$\angle Q \cong \angle R$  [**Isosceles triangle theorem**](1)

seg  $PQ \cong$  seg  $QR$  (given)

$\angle P \cong \angle R$  [**Isosceles triangle theorem**](2)

seg  $QR \cong$  seg  $PR$  (given)

$\angle Q \cong \angle P$  [**Isosceles triangle theorem**](3)

$\angle P \cong \angle Q \cong \angle R$ ...(from 1, 2 & 3)

