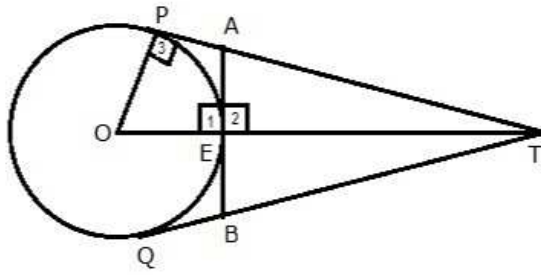


(ii)



given In fig $r = 5\text{ cm}$, $OT = 13\text{ cm}$, AB is tangent at E

to find AB

Sol

$$\angle 1 = \angle 3 = 90^\circ$$

In rt ΔOPT

$$PT^2 = OT^2 - OP^2$$

$$= 13^2 - 5^2$$

$$= 169 - 25$$

$$= 144$$

$$PT = \sqrt{144}$$

$$= 12\text{ cm}$$

($r \perp$ tangent)

(pythagoras theorem)

$$OP = OE = 5\text{ cm} \quad (\text{radii})$$

$$ET = OT - OE$$

$$= 13 - 5$$

$$= 8\text{ cm}$$

$$\angle 2 = 180^\circ - \angle 1 \quad (\text{linear pair})$$

$$= 180^\circ - 90^\circ$$

$$= 90^\circ \quad \text{----- (i)}$$

$$AP = AE = x \text{ (let)} \quad [\text{tangents from same external pts}]$$

In rt ΔAET

$$AT^2 = AE^2 + ET^2$$

(pythagoras theorem)

$$(12-x)^2 = x^2 + 8^2$$

$$\Rightarrow 144 + x^2 - 24x = x^2 + 64$$

$$\Rightarrow 24x = 80$$