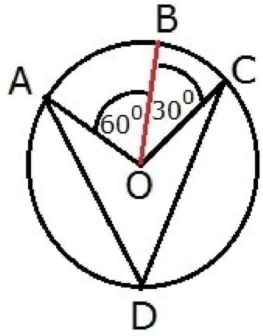
(1)



Sol $\angle AOC = \angle AOB + \angle BOC$

$= 60° + 30°$

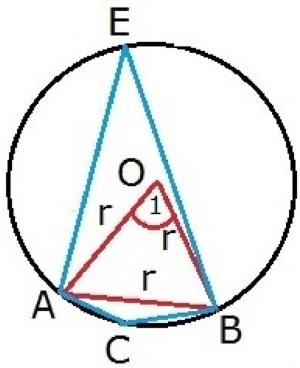
$= 90°$

$\angle AOC = 2\angle ADC$ [central $\angle$ = 2 inscribed $\angle$]

$\frac{90}{2} = \angle ADC$

$\Rightarrow \angle ADC = 45°$

(2)



to find $\angle C$, $\angle E$

solution $AB = r$

$OA = OB = r$ (radii)

$\triangle OAB$ is equilateral

[$OA = OB = AB = r$]

$\therefore \angle 1 = 60°$ [each $\angle$ of equilateral $\triangle$]

$\angle 1 = 2\angle E$ [central $\angle$ = 2 inscribed $\angle$]

$\frac{60}{2} = \angle E$

$\Rightarrow \angle E = 30°$

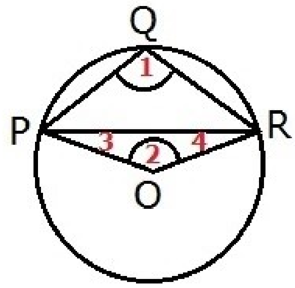
$\angle C + \angle E = 180°$ [opposite $\angle$s of a cyclic $\square$]

$\angle C + 30° = 180°$

$\Rightarrow \angle C = 180° - 30°$

$= 150°$

(3)



to find $\angle OPR$

Sol -

Reflex $\angle POR = 2\angle 1$

$= 2 \times 100$

$= 200°$

$\angle 2 + \text{Reflex } \angle POR = 360°$

$\angle 2 + 200 = 360$

$\Rightarrow \angle 2 = 360° - 200°$

$= 160°$

In $\triangle OPR$

$OP = OR$ (radii of same ⊙)

$\Rightarrow \angle 4 = \angle 3$ (isosceles $\triangle$ property)

$\angle 3 + \angle 4 + \angle 2 = 180°$

$\angle 3 + \angle 3 + 160 = 180°$ [$\because \angle 3 = \angle 4$]

$\Rightarrow 2\angle 3 = 180° - 160°$

$\Rightarrow \angle 3 = \frac{20}{2}$

$\Rightarrow \angle OPR = 10°$