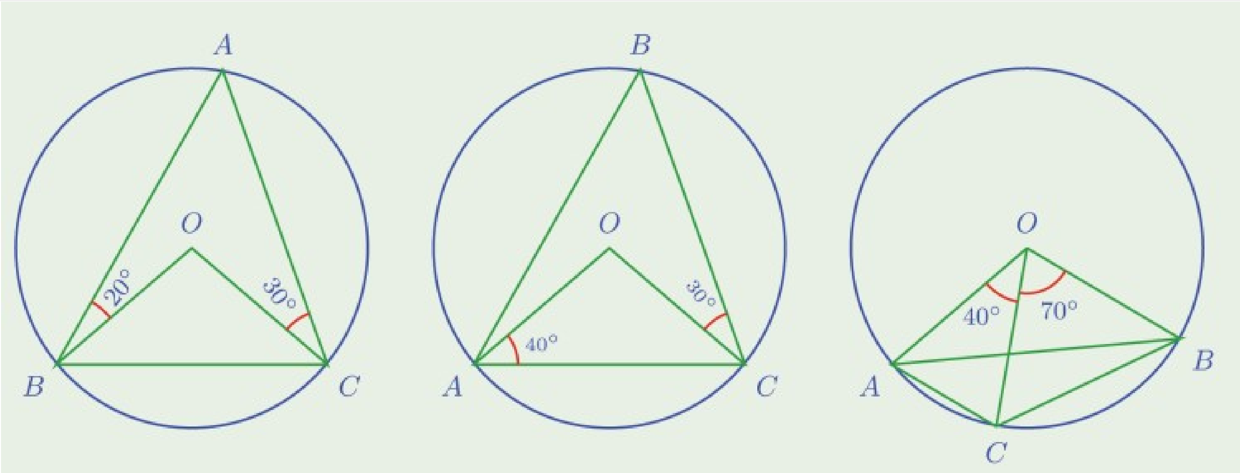
MATHEMATICS ONLINE CLASS X ON 02-08-2021

CIRCLES

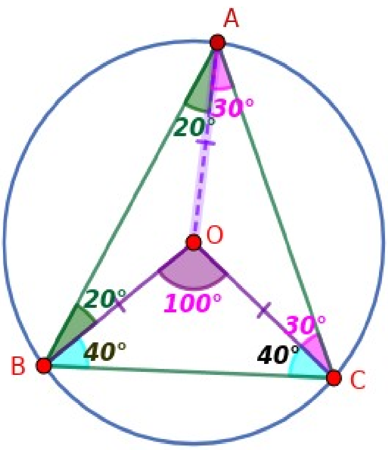
click

Answers to assignments of previous class

In all the pictures given below, O is the centre of the circle and A , B , C are points on it . Calculate all angles of △ABC and △ OBC in each .



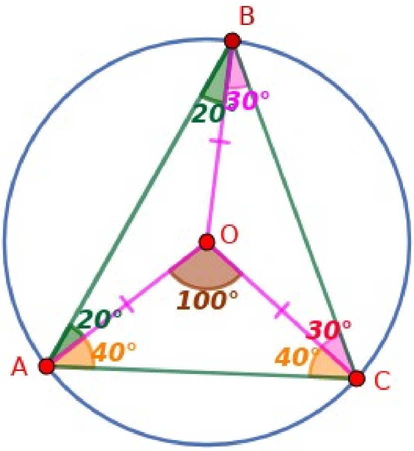
Answer



In the figure, ∠ABO = 20°,
∠ACO = 30°.
Join OA.
OA, OB and OC are radii of circle.
∴ OA = OB = OC
ΔAOB and ΔAOC are isosceles triangles.
∠ABO = ∠BAO = 20°
∠ACO = ∠CAO = 30°
∠BAC = 20° + 30° = 50°
∴∠BOC = 2 × 50° = 100°
ΔOBC is an isosceles triangle.
∠OBC = ∠OCB
∠OBC + ∠OCB = 180 - ∠BOC
= 180 – 100 = 80°

$$\therefore \angle OBC = \angle OCB = \frac{80^0}{2} = 40^0$$

Angles of ΔOBC are 100°, 40°, 40°
Angles of ΔABC are 50°, 60°, 70°



In the figure, ∠OAC = 40°, ∠ACO = 30°.

Join OB.

OA, OB and OC are radii of circle.

∴ OA = OB = OC

ΔOAC is an isosceles triangle.

∠OAC =∠OCA = 40°

∠AOC = 180 – (40°+ 40°) = 180 – 80 = 100°

∠ABC = $\frac{100^0}{2}$ **=** 50^0

ΔOBC is an isosceles triangle.

∠OCB = ∠OBC = 30°

∠BOC = 180 – (30°+ 30°) = 180 – 60 = 120°

∠OBA = ∠ABC - ∠OBC = 50° - 30° = 20°

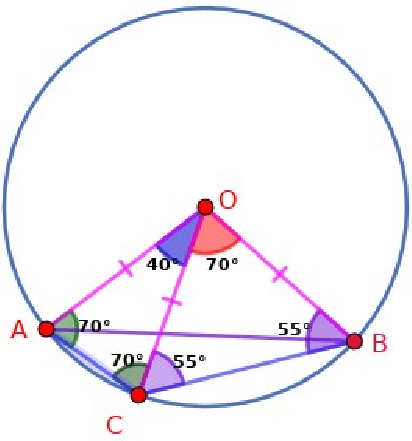
ΔOAB is an isosceles triangle.

Therefore, ∠OBA = ∠OAB = 20°

That is,

Angles of ΔOBC are 120°, 30°, 30°

Angles of ΔABC are 60°, 50°, 70°



In the figure, ∠AOC = 40°, ∠BOC = 70°.

Join OB. OA, OB and OC are radii of circle.

Therefore, OA = OB = OC

ΔOBC is an isosceles triangle.

∠OCB = ∠OBC = $\frac{180^0 - 70^0}{2}$

$= \frac{110^0}{2} = 55^0$

∠CAB is an angle made by arc CB at its alternate arc CAB.

∠CAB = $\frac{70^0}{2}$ **=** 35^0

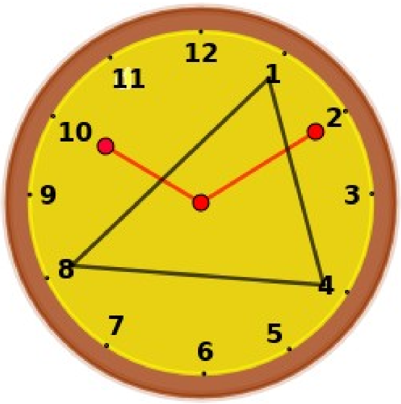
∠ABC is an angle made by arc AC at its alternate arc ABC.

∠ABC = $\frac{40^0}{2}$ **=** 20^0

∠ACB =180 – (35°+ 20°) = 180 – 55 = 125°

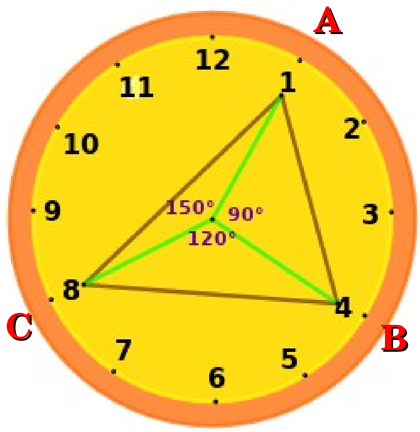
Angles of ΔOBC are 70°, 55°, 55°.

Angles of ΔABC are 35°, 20°, 125°.



The numbers 1 , 4 , 8 on a clock's face are joined to make a triangle.Calculate the angles of this triangle?
How many equilateral triangles can we make by joining numbers on the clock's face ?

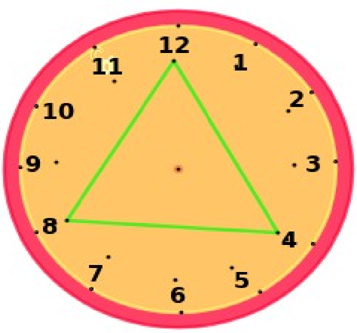
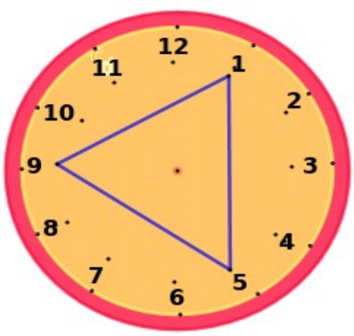
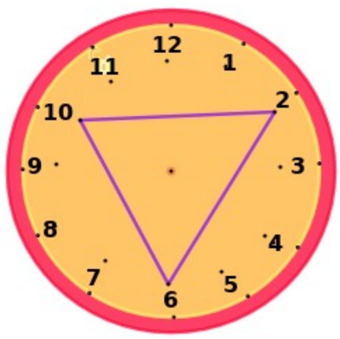
Answer

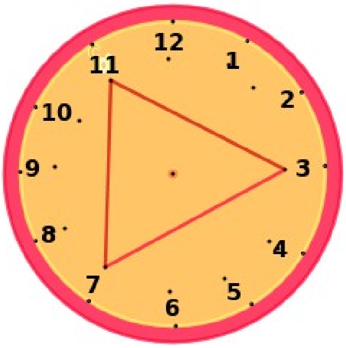


Angle around a point is 360°.
In a clock's face,
60 minutes = 360°
1 minute = 6°
5 minutes = 30°
Central angle of arc BC = ∠BOC = 120°
Central angle of arc AC = ∠AOC = 150°
Central angle of arc AB = ∠AOB = 90°

$\angle A = \frac{120^0}{2} = 60^0$, $\angle B = \frac{150^0}{2} = 75^0$, $\angle C = \frac{90^0}{2} = 45^0$

ΔABC becomes an equilateral triangle when each central angle is 120°.

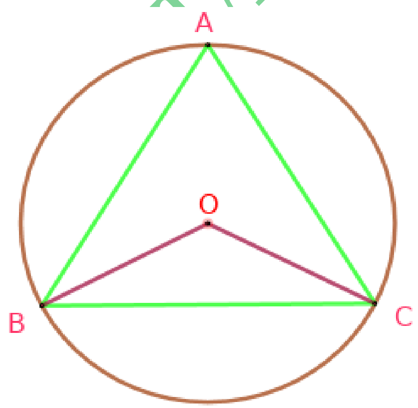






4 equilateral triangle can draw in a clock. (By joining 12,4,8 , 1,5,9 , 2,6,10 and 3,7,11)

Assignments

1) In the figure, O is the centre of the circle and ABC is an equilateral triangle. Find BAC and ∠ABO



2)

In the picture O is the centre of the circle and A , B , C are points on it . Prove that ∠OAC + ∠ABC = 90^0