



Octahedral classes, kharadi
2nd floor, yashwant plaza, near bank of India,

Class 09 - Mathematics

Circles / Lines and Angles

Maximum Marks: 50

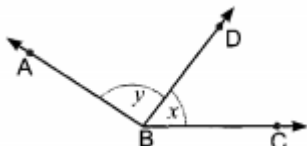
Time Allowed: 1 hour and 30 minutes

Section A

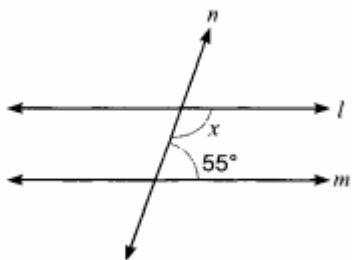
1. Answer the following

10

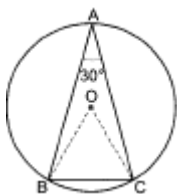
- a) For what value of $x + y$ in Fig., will ABC be a line?



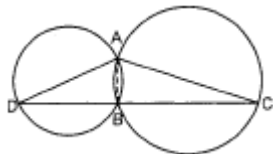
- b) Find the angle whose complement is equal to the angle itself.
c) Find the measure of the complementary angle of 72° .
d) How many triangles can be drawn having is angles as 53° , 64° and 63° ? Give reason for your answer.
e) In Fig., find the value of x for which the lines l and m are parallel.



- f) If BM and CN are the perpendiculars, drawn on the sides AB and AC of the $\triangle ABC$, then prove that the points B, C, M, and N are cyclic.
g) Given a pentagon ABCDE. If the quadrilaterals ABCD and BCDE are cyclic, prove that the pentagon is also cyclic.
h) Two circles with centres A and B intersect at C and D. Prove that $\angle ACB = \angle ADB$.
i) In given figure, $\angle BAC = 30^\circ$. Show that BC is equal to the radius of the circumcircle of $\triangle ABC$ whose centre is O.



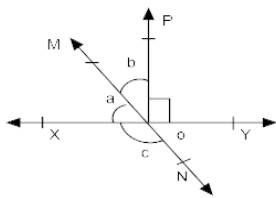
- j) In the given figure, two circles intersect at two points A and B. AD and AC are diameters to the circles. Prove that B lies on the line segment DC.



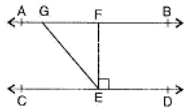
2. Answer the following

20

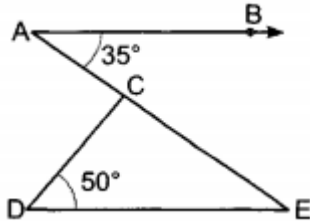
- a) An exterior angle of a triangle is 115° and one of the opposite angles is 35° . Find the other two angles.
b) In fig lines XY and MN intersect at O If $\angle POY = 90^\circ$ and $a:b = 2:3$ find $\angle c$.



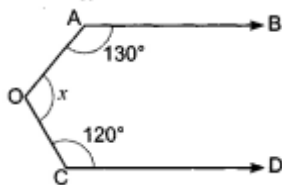
- c) In figure, if $AB \parallel CD$, $EF \perp CD$ and $\angle GED = 126^\circ$. Find $\angle AGE$, $\angle GEF$ and $\angle FGE$.



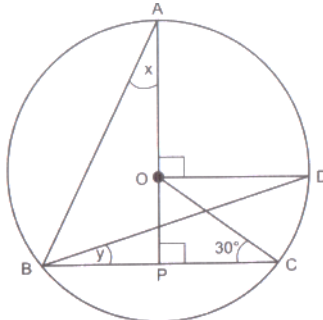
- d) In Fig., if $AB \parallel DE$, $\angle BAC = 35^\circ$ and $\angle CDE = 50^\circ$, find $\angle DCE$.



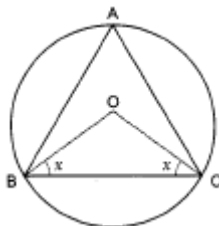
- e) In Fig., $AB \parallel CD$. Find the value of x .



- f) O is the centre of the circle, $\angle BCO = 30^\circ$. Find x and y .

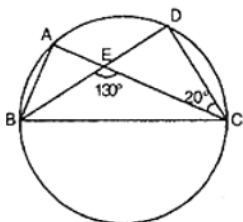


- g) In the figure,. Prove that $\angle OBC + \angle BAC = 90^\circ$

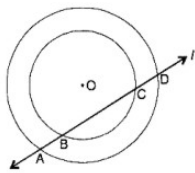


- h) A chord of a circle is equal to the radius of the circle. Find the angle subtended by the chord at a point on the minor arc and also at a point on the major arc.

- i) In figure, A, B, C, D are four points on the circle. AC and BD intersect at a point E such that $\angle BEC = 130^\circ$ and $\angle ECD = 20^\circ$ Find $\angle BAC$.



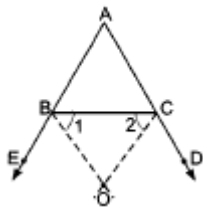
- j) l is a line which intersects two concentric circles (i.e. circles with the same centre) with common centre O at A, B, C and D. Prove that $AB = CD$.



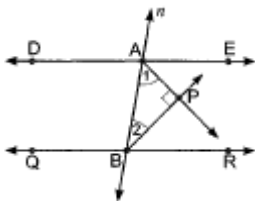
3. Answer the following

20

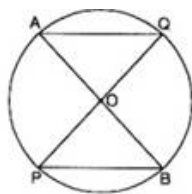
- a) In $\triangle ABC$ in given figure, the sides AB and AC of $\triangle ABC$ are produced to points E and D respectively. If bisectors BO and CO of $\angle CBE$ and $\angle BCD$ respectively meet at point O, then prove that $\angle BOC = 90^\circ - \frac{1}{2} \angle A$.



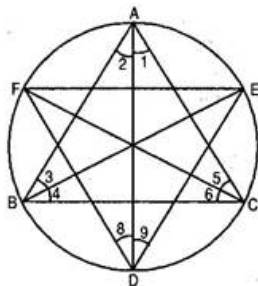
- b) If two lines intersect, prove that the vertically opposite angles are equal.
c) In given figure, $DE \parallel QR$ and AP and BP are bisectors of $\angle EAB$ and $\angle RBA$ respectively. Find $\angle APB$.



- d) It is given that $\angle XYZ = 64^\circ$ and XY is produced to point P. Draw a figure from the given information. If ray YQ bisects $\angle ZYP$. Find $\angle XYQ$ and reflex $\angle QYP$
e) In figure, a diameter AB of a circle bisects a chord PQ. If $AQ \parallel PB$, prove that the chord PQ is also a diameter of the circle.



- f) Bisectors of angles A, B and C of a triangle ABC intersect its circumcircle at D, E and F respectively. Prove that angles of the triangle are $\left(90^\circ - \frac{A}{2}\right)$, $\left(90^\circ - \frac{B}{2}\right)$ and $\left(90^\circ - \frac{C}{2}\right)$ respectively.



- g) ABCD is a cyclic quadrilateral whose diagonal AC and BD intersect at P. If $AB = DC$, Prove that:
i. $\triangle PAB \cong \triangle PDC$
ii. $PA = PD$ and $PC = PB$
iii. $AD \parallel BC$.
h) ABCD is a cyclic trapezium with $AD \parallel BC$. If $\angle B = 70^\circ$, determine other three angles of the trapezium.