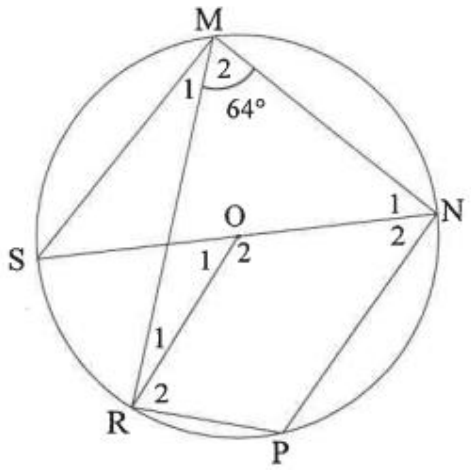
EUCLIDEAN GEOMETRY GR 11

NOV 2022

QUESTION 8

8.1 In the diagram, O is the centre of the circle. MNPR is a cyclic quadrilateral and SN is a diameter of the circle. Chord MS and radius OR are drawn. $\hat{M}_2 = 64°$.



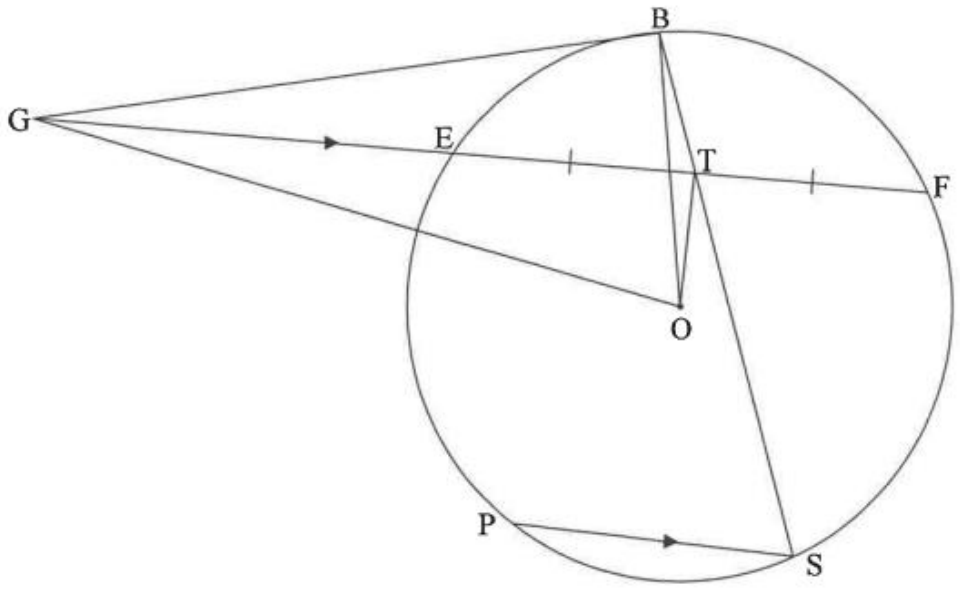
Determine, giving reasons, the size of the following angles:

8.1.1 $\hat{P}$ (2)

8.1.2 $\hat{M}_1$ (2)

8.1.3 $\hat{O}_1$ (2)

9.2 In the diagram, E, B, F, S and P are points on the circle centred at O. GB is a tangent to the circle at B. FE is produced to meet the tangent at G. OT is drawn such that T is the midpoint of EF. GO and BO are drawn. BS is drawn through T. PS || GF.



Prove, giving reasons, that:

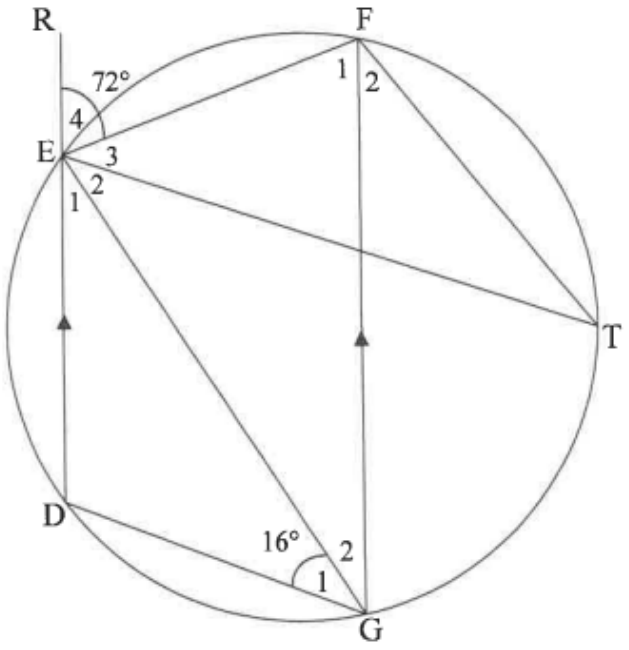
9.2.1 OTBG is a cyclic quadrilateral (5)

9.2.2 $G\hat{O}B = \hat{S}$ (4)

[14]

QUESTION 9

9.1 In the diagram, DEFG is a cyclic quadrilateral with DE ∥ GF. DE is produced to R. T is another point on the circle. EG, FT and ET are drawn. $\hat{E}_4 = 72°$ and $\hat{G}_1 = 16°$.



Determine, with reasons, the size of the following angles:

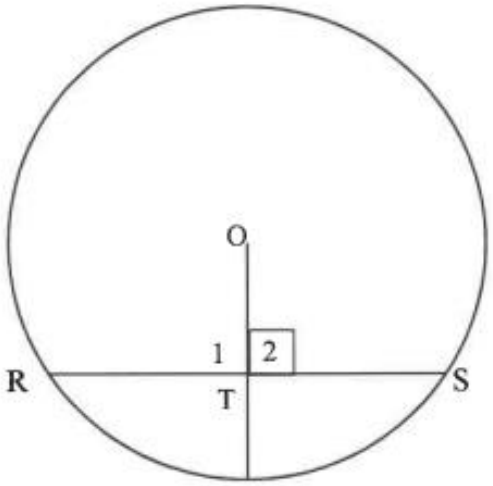
9.1.1 $D\hat{G}F$ (2)

9.1.2 $\hat{T}$ (2)

9.1.3 $G\hat{E}F$ (2)

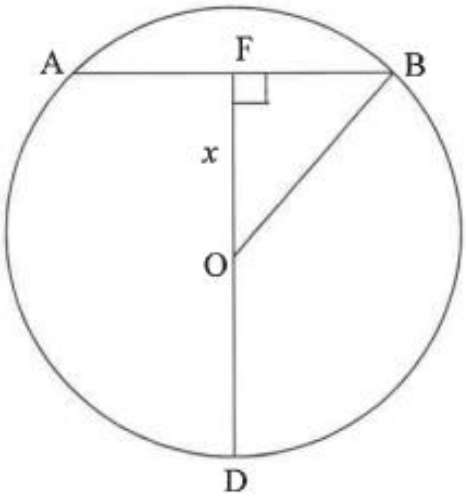
QUESTION 9

9.1 In the diagram below, O is the centre of the circle and point T lies on chord RS. Prove the theorem which states that if $OT \perp RTS$ then $RT = TS$.



(5)

9.2 In the diagram, O is the centre of circle ABD. F is a point on chord AB such that $DOF \perp AB$. $AB = FD = 8$ cm and $OF = x$ cm.

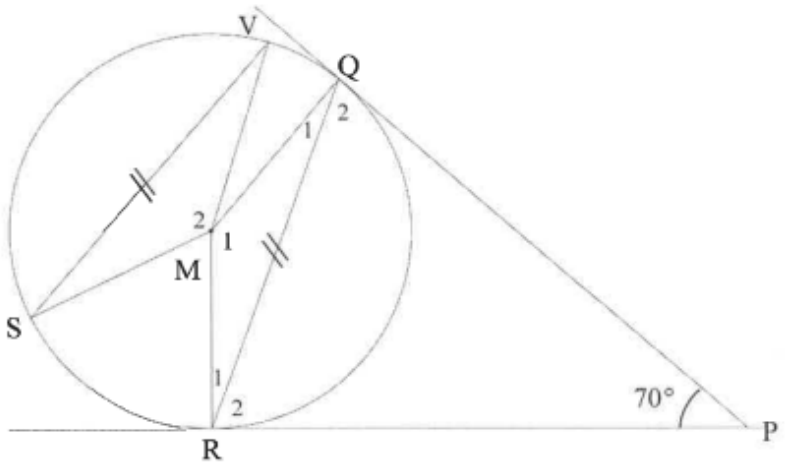


Determine the length of the radius of the circle. (5)

[10]

QUESTION 10

M is the centre of the circle SVQR having equal chords SV and QR.
RP and QP are tangents to the circle at R and Q respectively such that $R\hat{P}Q = 70°$.



10.1 Calculate the size of $\hat{R}_2$. (4)

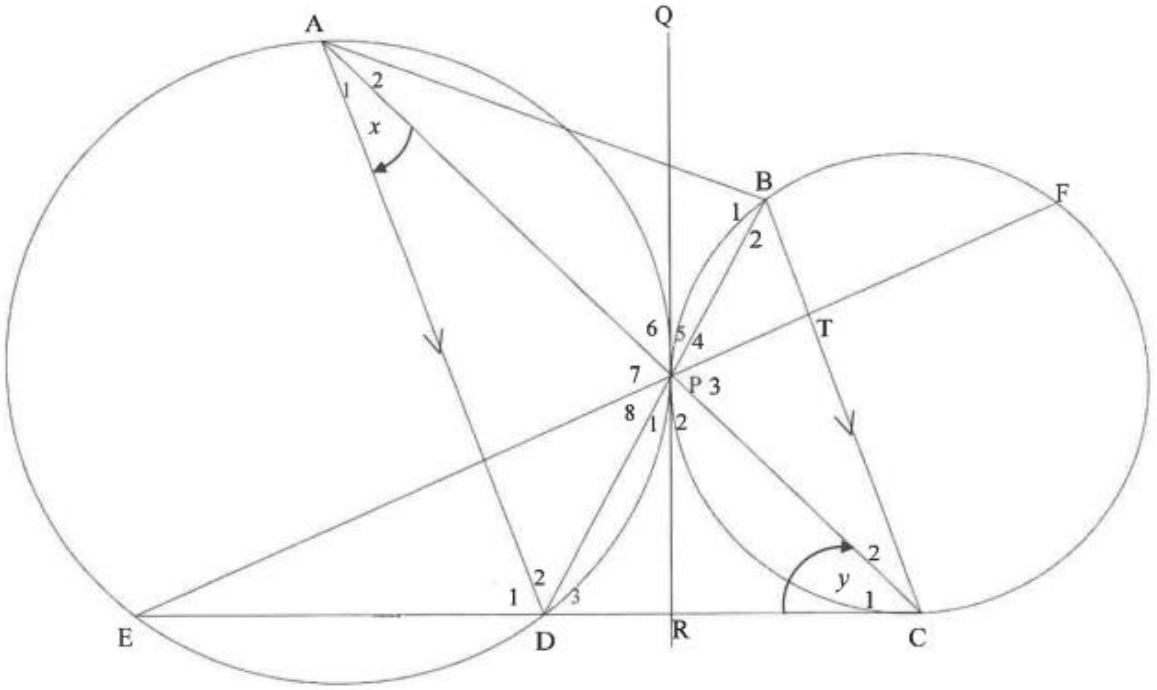
10.2 Calculate the size of $\hat{Q}_1$. (2)

10.3 Determine the size of $\hat{M}_2$. (3)

[9]

QUESTION 12

In the diagram below, two circles touch each other externally at point P.
QPR is a common tangent to both circles at P. EDRC is a tangent to circle PBFC at C.
$R\hat{C}A = y$ and $D\hat{A}C = x$. AD || BC.



12.1 Name, with reasons, FOUR other angles equal to x. (7)

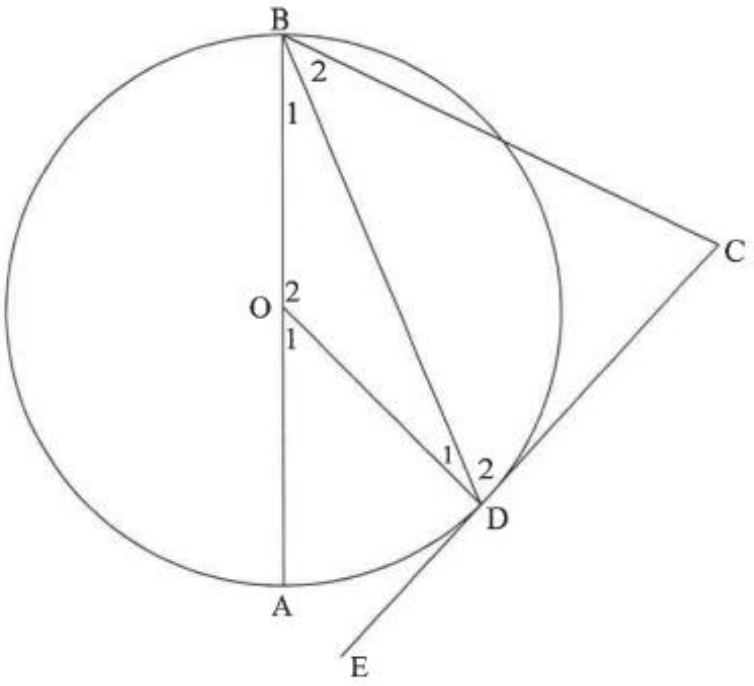
12.2 Show that $E\hat{P}A = x + y$ (4)

12.3 Determine the numerical value of $x + y$, if it is given that DCTP is a cyclic quadrilateral. (4)

[15]

QUESTION 11

In the diagram below, O is the centre of the circle. CDE is a tangent to the circle at D. DB bisects $A\hat{B}C$. Let $\hat{B}_1 = x$



11.1 Prove that $BC \parallel OD$ (4)

11.2 Show that $\hat{C} = 90°$ (3)

[7]

QUESTION 12

In the diagram below, two circles touch each other externally at point P.
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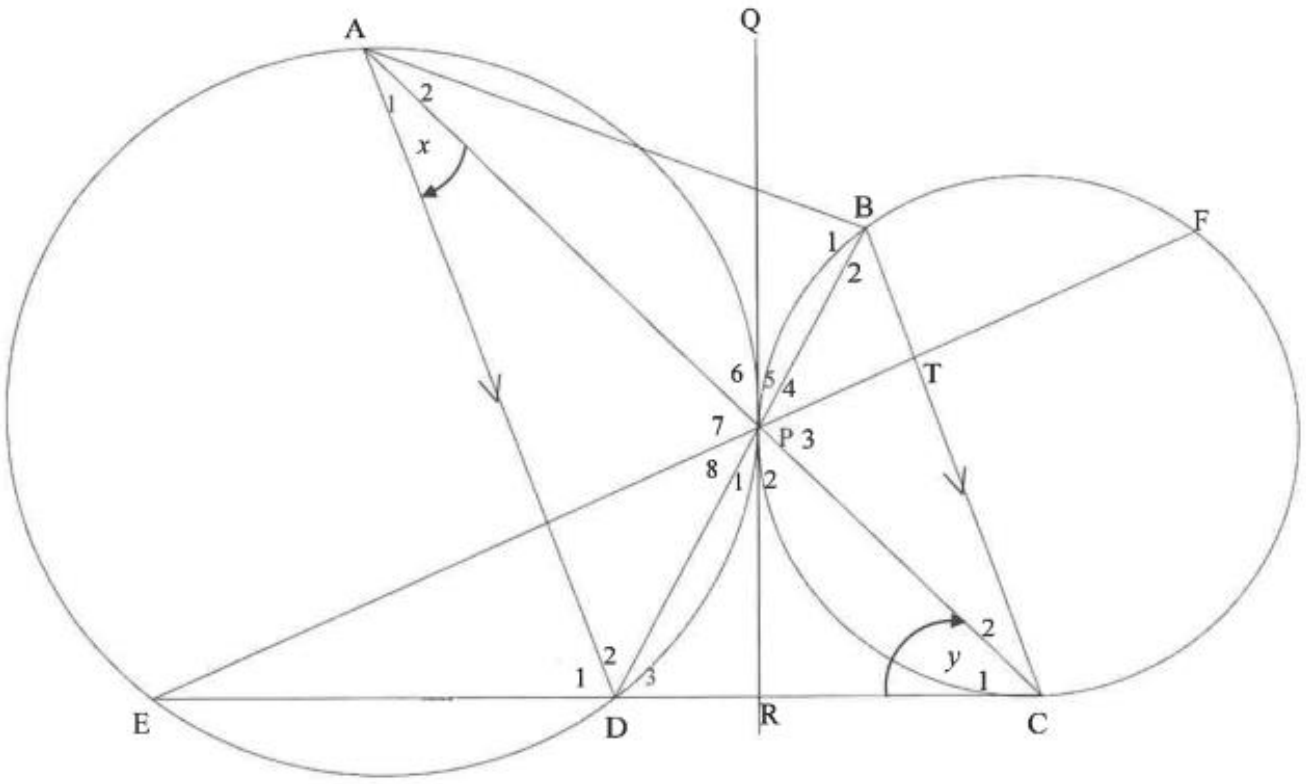
$R\hat{C}A = y$ and $D\hat{A}C = x$. AD || BC.



12.1 Name, with reasons, FOUR other angles equal to x. (7)

12.2 Show that $E\hat{P}A = x + y$ (4)

12.3 Determine the numerical value of $x + y$, if it is given that DCTP is a cyclic quadrilateral. (4)

[15]