WANDOOR GANITHAM – S.S.L.C STUDY MATERIAL 2021

FOCUS AREA - QUESTION BANK - TANGENTS

1 *There is a point* **10** *cm away from the centre of a circle of radius* **6** *cm . A tangent is drawn through that point .*

a) *What is the angle between a tangent at a point and the radius through that point ?*

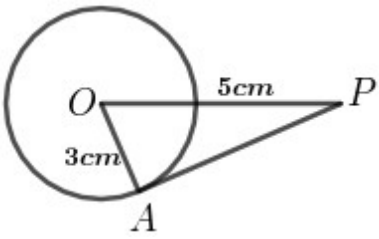
b) *What is the length of the tangent ?*

2 *In the figure ,O is the centre of the circle and AP is a tangent*

OA = **3** *cm , OP* = **5** *cm .*

a) *What is the measure of* $< OAP$ *?*

b) *What is the length of the tangent PA ?*

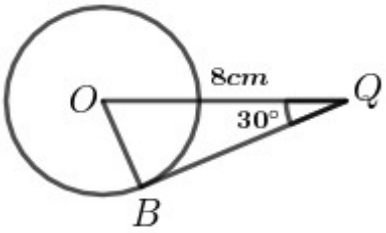


3 *In the figure , O is the centre of the circle and QB is a tangent . OQ* = **8** *cm , <* $OQB = 30^0$

a) *What is the measure of* $< OBQ$ *?*

b) *What is the radius of the circle ?*

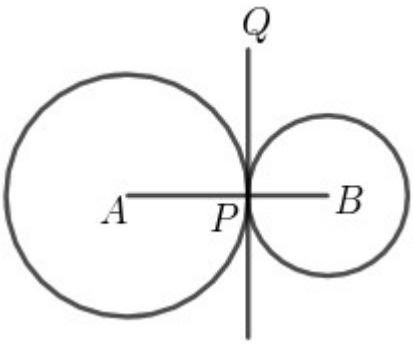
c) *What is the length of the tangent QB ?*



4 *In the figure ,two circles intersect at P . PQ is a tangent to the circle with centre A .*

a) *What is the measure of* $< APQ$ *?*

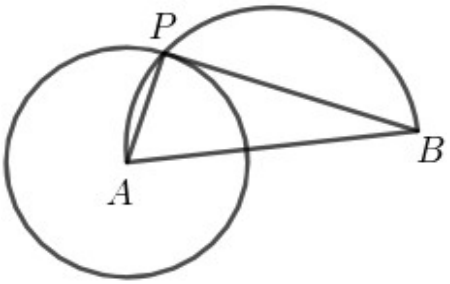
b) *Prove that PQ is a tangent to the circle with centre B ?*



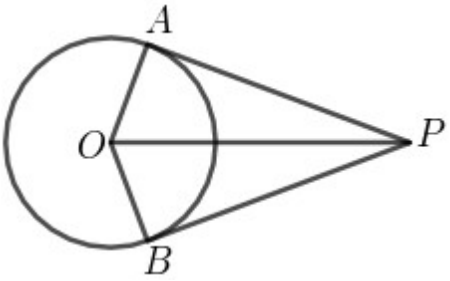
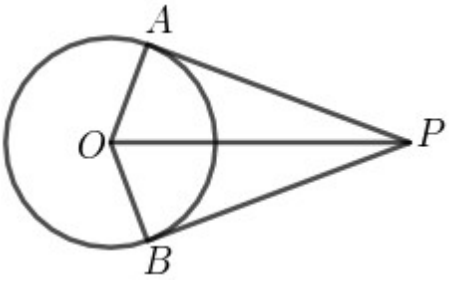
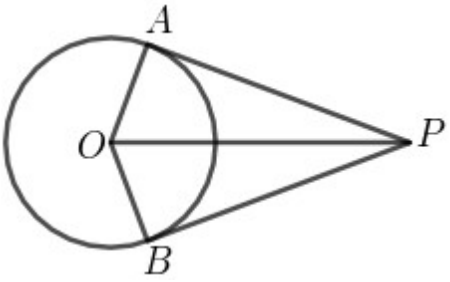
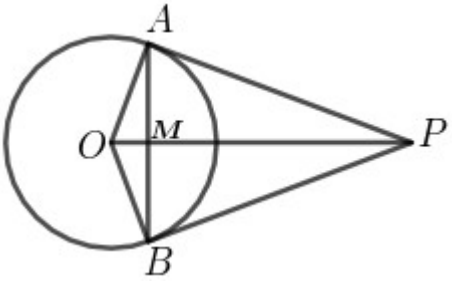
5 *In the figure ,a circle and a semicircle intersect at P . A is the centre of the circle and AB is the diameter of the semicircle .*

a) *What is the measure of* $< APB$ *?*

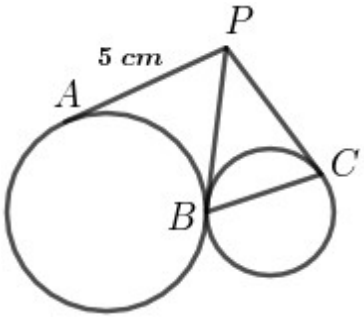
b) *Prove that BP is a tangent to the circle with centre A ?*



6	*In the figure , diagonals of a rhombus intersect at a point P on the circle with centre A .* **a)** *What is the measure of < APD ?* **b)** *Prove that DP is a tangent to the circle with centre A ?*
7	*In the figure ,O is the centre of the circle and the tangents through the points A and B . intersect at P . < APB = 40⁰* **a)** *What is the measure of < OAP ?* **b)** *What is the measure of < AOB ?*
8	*In the figure , O is the centre of the circle and the tangents through the points A and B . < AOB = 130⁰* **a)** *What is the measure of < OAP ?* **b)** *What is the measure of < APB ?*
9	*In the figure , A and B are the centres of the circles . Tangents are drawn from a point P to these circles . < CAD = 120⁰* **a)** *What is the measure of < ACP ?* **b)** *What is the measure of < CPD ?* **c)** *What is the measure of < EBF ?*
10	*In the figure O is the centre of the incircle . The circle touches the sides of the triangle at the points P , Q and R < BAC = 55⁰ , < ABC = 45⁰* **a)** *What is the measure of < BPO ?* **b)** *What is the measure of < POQ ?* **c)** *What is the measure of < QOR ?*

11	***In the figure , O is the centre of circle and the tangents through the points A and B intersect at P .*** **a)** ***What is the measure of < OAP ?*** **b)** ***Prove that the triangles AOP and BOP are equal ?*** **c)** ***Prove that the tangents have the same length ?*** 
12	***In the figure , O is the centre of circle and the tangents through the points A and B intersect at P .*** **a)** ***What is the measure of < OAP ?*** **b)** ***Prove that the triangles AOP and BOP are equal ?*** **c)** ***Prove that OP is the bisector of < APB ?*** 
13	***In the figure , O is the centre of circle and the tangents through the points A and B intersect at P .*** **a)** ***What is the measure of < OAP ?*** **b)** ***Prove that the triangles AOP and BOP are equal ?*** **c)** ***Prove that OP is the bisector of < AOB ?*** 
14	***In the figure , O is the centre of circle and the tangents through the points A and B intersect at P .*** **a)** ***What is the measure of < OAP ?*** **b)** ***Prove that the triangles AOP and BOP are equal ?*** **c)** ***Prove that the angles of the triangles AOM and BOM are equal ?*** **d)** ***Prove that OP is the bisector of AB ?*** **e)** ***What is the measure of < AMO ?*** 

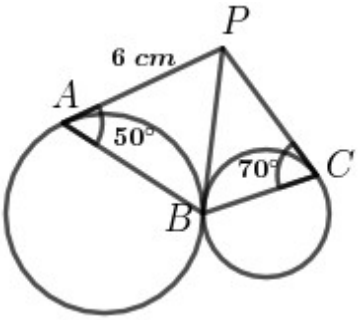
15 *In the figure two circle intersect at B . The tangents through A , B , C meet at P . PA = 5 cm .*



a) *What is the length of PB ?*

b) *Prove that PBC is an isosceles triangle ?*

16 *In the figure two circle intersect at B . The tangents through A , B , C meet at P . PA = 6 cm , < BAP = 50⁰ , < BCP = 70⁰*

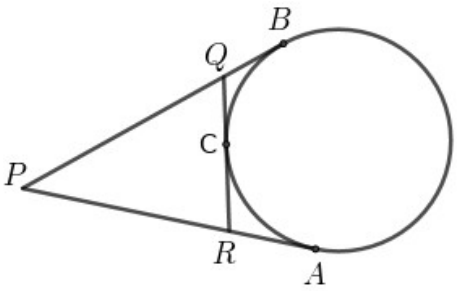


a) *What is the length of PB ?*

b) *What is the measure of < APB ?*

c) *What is the measure of < APC ?*

17 *In the figure , tangents through the points A and B of a circle intersect at P . QR is a tangent through C*

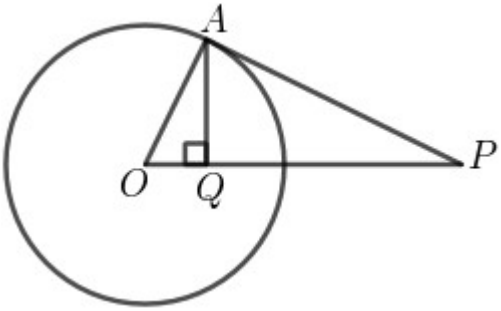


a) *Which other line has the same length as that of PA ?*

b) *Which other line has the same length as that of* **RC ?**

c) *Prove that the perimeter of the triangle PQR is double the length of PA ?*

18 *In th figure , O is the centre of the circle . AP is a tangent . AQ is perpendicular to OP .*

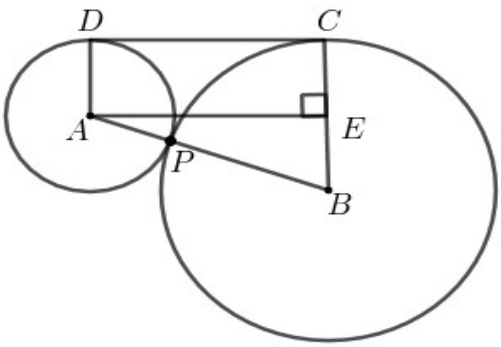


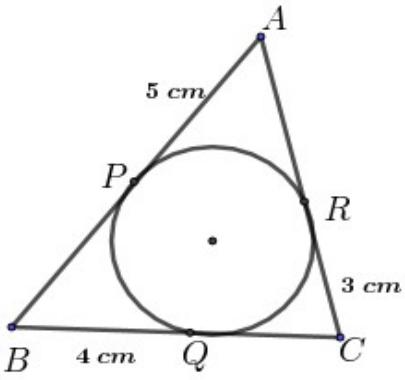
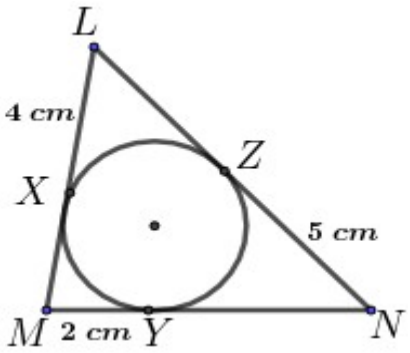
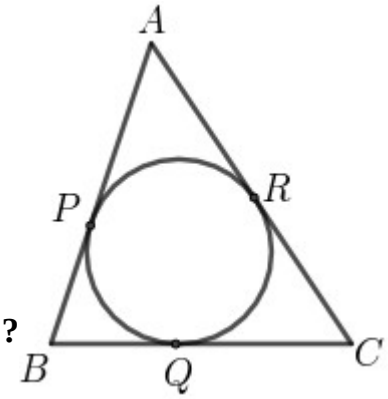
a) *What is the measure of < OAP ?*

b) *Prove that the angles of the triangles OAP and OAQ are same ?*

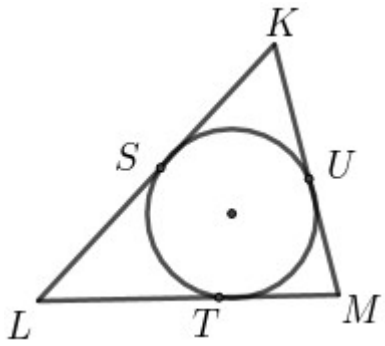
c) *Prove that OP x OQ = OA^2 ?*

19 *In the figure , two circles intersect at P . CD is the common tangent of the circles . Radius of the smaller circle is 4 cm and the radius of the larger circle is 7 cm. AE is perpendicular to BC .*



	a) ***What is the measure of*** $< ADC$ **?** **b)** ***Prove that AECD is a rectangle*** **?** **c)** ***What is the length of BE*** **?** **d)** ***What is the length of AB*** **?** **e)** ***What is the length of the tangent CD*** **?**
20	***In the figure , the circle touches the sides of the triangle ABC at the points P , Q , R . AP = 5 cm , BQ = 4 cm CR = 4 cm .*** **a)** ***What is the length of AR*** **?** **b)** ***What is the length of BC*** **?** **c)** ***What is the perimeter of the triangle ABC*** **?** 
21	***In the figure , the circle touches the sides of the triangle LMN at the points X ,Y , Z . LX = 4 cm , MY = 2 cm NZ = 5 cm .*** **a)** ***What is the length of LZ*** **?** **b)** ***What is the length of MN*** **?** **c)** ***What is the perimeter of the triangle LMN*** **?** 
22	***In the figure , the circle touches the sides of the triangle ABC at the points P ,Q , R . AB = 10 cm , BC = 8 cm AC = 12 cm .*** **a)** ***Which other line has the same length as that of AP*** **?** **b)** ***If the length AP is taken as*** x ***, what is the length of BQ*** **?** **c)** ***What is the value of*** x **?** **d)** ***What are the lengths of the lines AR , BP and CQ*** **?** 

23 *In the figure , the circle touches the sides of the triangle KLM at the points S , T , U . KL = 11 cm , LM = 9 cm , KM = 7 cm.*



a) *Which other line has the same length as that of KS ?*

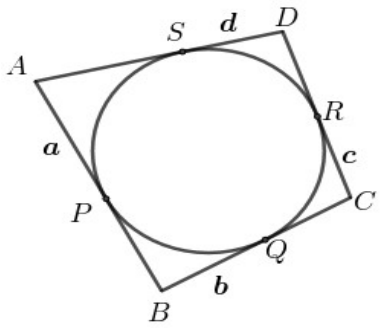
b) *If the length KS is taken as x , what is the length of LT ?*

c) *What is the value of x ?*

d) *What are the lengths of the lines KU , LS and MT ?*

24 *In the figure , the circle touches the sides of the quadrilateral at the points P , Q , R , S .*

AP = a , BQ = b , CR = c , DS = d



a) *What is the length of AS ?*

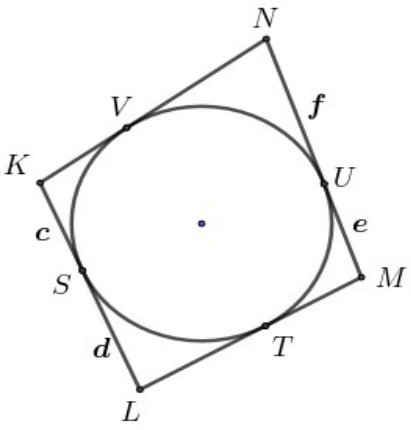
b) *What is the length of BC ?*

c) *What is the length of AD ?*

d) *What is the perimeter of* **ABCD** *?*

25 *In the figure , the circle touches the sides of the quadrilateral at the points S ,T , U , V*

KS = c , LS = d , MU = e , NU = f



a) *What is the length of KV ?*

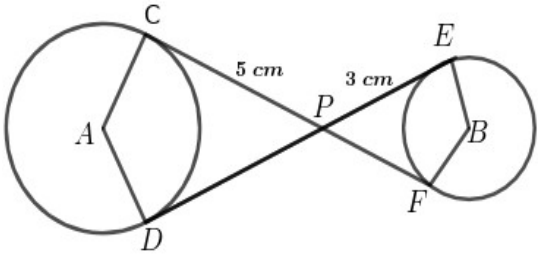
b) *What is the length of LM ?*

c) *What is the length of KN ?*

d) *What is the perimeter of KLMN ?*

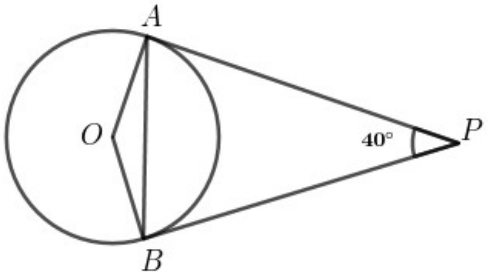
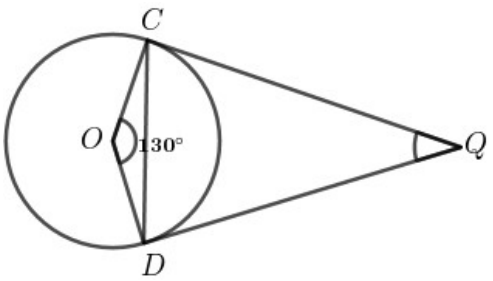
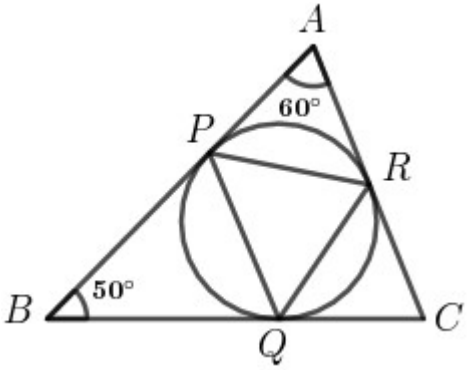
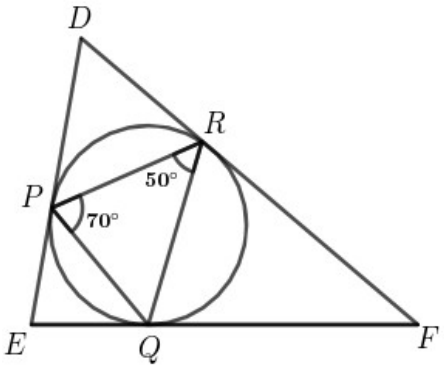
26 *In the figure , A and B are the centres of the circles and tangents are drawn from a point P to the circles*

PC = 5 cm , PE = 3 cm



a) *What is the length of PD ?*

b) *What is the length of CF ?*

27	***In the figure , O is the centre of the circle and tangents through the points A and B intersect at P .*** ***< APB = 40⁰*** **a)** ***What is the measure of < AOB ?*** **b)** ***What is the measure of < OAB ?*** **c)** ***What is the measure of < ABP ?*** 
28	***In the figure , O is the centre of the circle and tangents through the points C and D intersect at Q .*** ***< COD = 130⁰*** **a)** ***What is the measure of < CQD ?*** **b)** ***What is the measure of < CDQ ?*** **c)** ***What is the measure of < ODC ?*** 
29	***In the figure , the circle touches the sides of the triangle ABC at the points P ,Q , R .*** ***< A = 60⁰ , < B = 50⁰*** **a)** ***What is the measure of < BQP ?*** **b)** ***What is the measure of < PRQ ?*** **c)** ***What is the measure of < PQR ?*** 
30	***In the figure , the circle touches the sides of the triangle DEF at the points P ,Q , R .*** ***< QPR = 70⁰ , < PRQ = 50⁰*** **a)** ***What is the measure of < EQP ?*** **b)** ***What is the measure of < E ?*** **c)** ***What is the measure of < F ?*** 

31 *In the figure , O is the centre of the incircle .*

$< B = 90^0$, $BC = a$, $AC = b$, $AB = c$

a) *What is the measure of* $< OPB$?

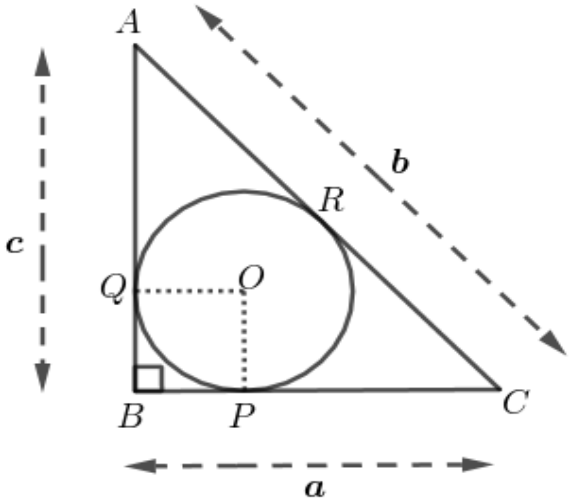
b) *Prove that BPOQ is a square ?*

c) *If the radius of the incircle is taken as* r ,

what is the length of CP ?

d) *What is the length of AR ?*

e) *Prove that the diameter of the incircle is* $a + c - b$.



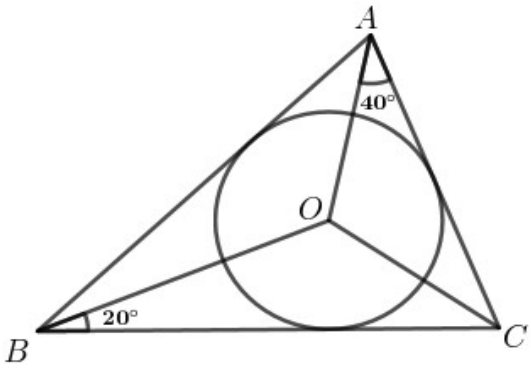
32 *In the figure , O is the centre of the incircle .*

$< OBC = 20^0$, $< OAC = 40^0$

a) *What is the measure of* $< OBA$?

b) *What is the measure of* $< BAC$?

c) *What is the measure of* $< OCB$?

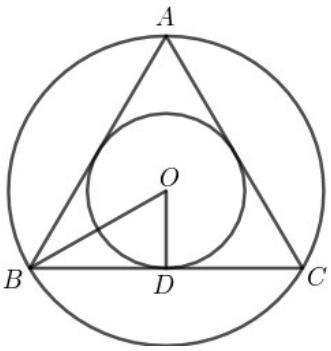


33 *In the figure ABC is an equilateral triangle . O is the centre of the circumcircle and incircle .*

a) *What is the measure of* $< ODB$?

b) *What is the measure of* $< OBD$?

c) *Prove that the radius of the circumcircle of an equilateral triangle is double its radius of the incircle*



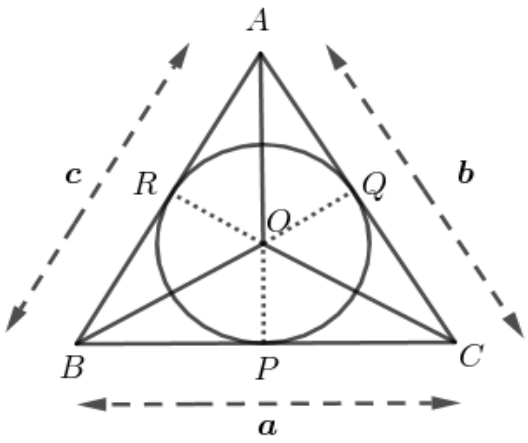
34 *In the figure , O is the centre of the triangle ABC*

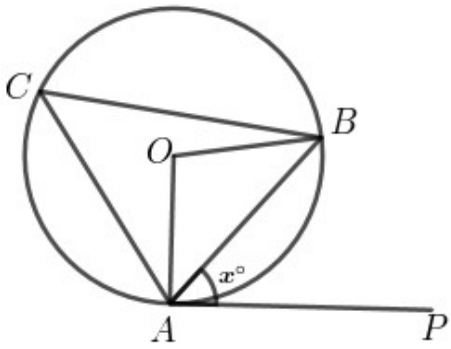
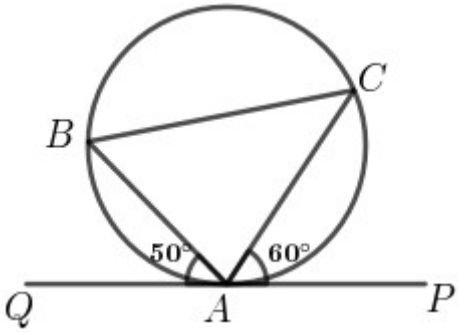
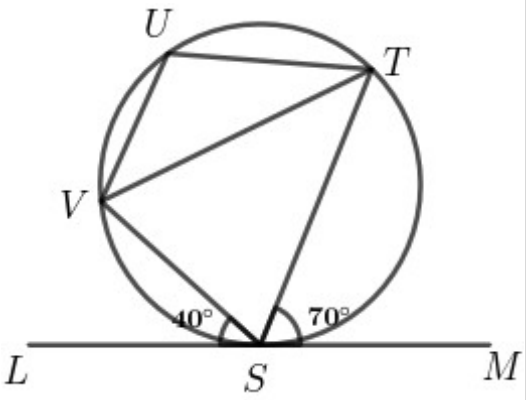
The circle touches the sides of the triangle at P , Q , R . $BC = a$, $AC = b$, $AB = c$

a) *What is the perimeter of the triangle ABC ?*

b) *What is the measure of* $< OPB$?

c) *What is the area of the triangle BOC ?*



	d) ***What is the area of the triangle AOC ?*** **e)** ***Prove that the area of a triangle ABC is the product of the radius of its incircle and half its perimeter ?***
35	***The side of an equilateral triangle is 4 cm*** **a)** ***What is its perimeter ?*** **b)** ***What is its area ?*** **c)** ***What is its radius of its incircle ?***
36	***In the figure O is the centre and AP is a tangent*** $< BAP = x^0$ **a)** ***What is the measure of*** $< OAP$ **?** **b)** ***What is the measure of*** $< OBA$ **?** **c)** ***What is the measure of*** $< AOB$ **?** **d)** ***What is the measure of*** $< ACB$ **?** 
37	***In the figure PQ is a tangent .*** $< BAQ = 50^0, < CAP = 60^0$ **a)** ***What is the measure of*** $< BCA$ **?** **b)** ***What is the measure of*** $< ABC$ **?** 
38	***In the figure LM is a tangent .*** $< LSV = 40^0$, $< TSM = 70^0$ **a)** ***What is the measure of*** $< STV$ **?** **b)** ***What is the measure of*** $< SVT$ **?** **c)** ***What is the measure of*** $< TUV$ **?** 

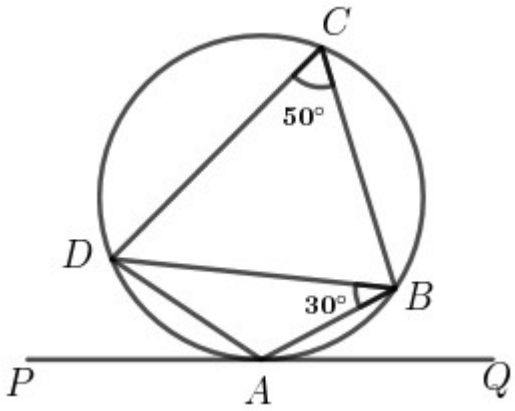
39 *In the figure PQ is a tangent .*

$< ABD = 30^0$, $< BCD = 50^0$

a) *What is the measure of* $< BAD$?

b) *What is the measure of* $< PAD$?

c) *What is the measure of* $< ADB$?



40 *In the figure , tangents through the points A and B intersect at P .* $PA = 7\ cm$, $< APB = 40^0$

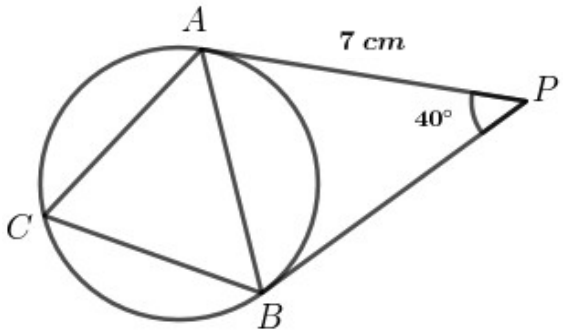
$AC = BC$

a) *What is the length of* PB ?

b) *What is the measure of* < ABP ?

c) *What is the measure of* < ACB ?

d) *What is the measure of* < CAP ?



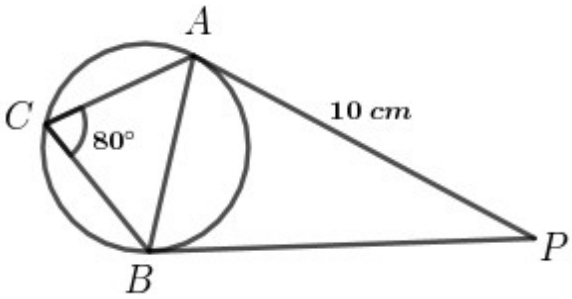
41 *In the figure , tangents through the points A and B intersect at P .* $AC = BC$, $PA = 10\ cm$

a) *What is the measure of* $< ABP$?

b) *What is the length of* PB ?

c) *What is the measure of* $< APB$?

d) *What is the measure of* $< CAP$?



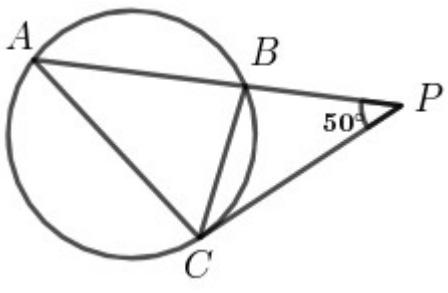
42 *In the figure PC is a tangent .*

$< BPC = 50^0$, $BC = BP$

a) *What is the measure of* $< BCP$?

b) *What is the measure of* $< BAC$?

c) *What is the measure of* $< ABC$?



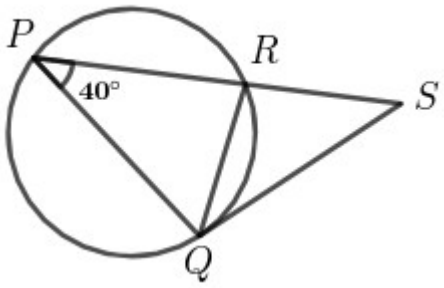
43 ***In the figure QS is a tangent .***

$< QPR = 40^0$, $RQ = RS$

a) ***What is the measure of*** $< RQS$ **?**

b) ***What is the measure of*** $< QRS$ **?**

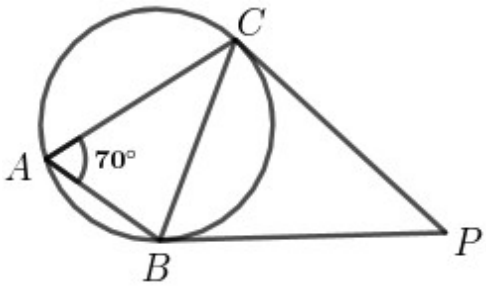
c) ***What is the measure of*** $< PQR$ **?**



44 ***In the figure , tangents through the points B and C intersect at P .*** $< BAC = 70^0$

a) ***What is the measure of*** $< PBC$ **?**

b) ***What is the measure of*** $< BPC$ **?**



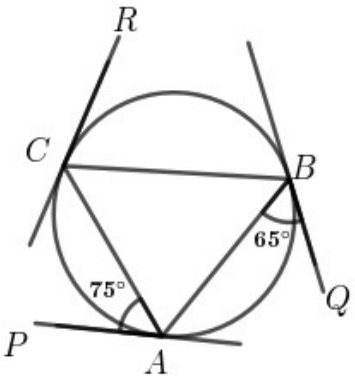
45 ***In the figure PA , QB and C are tangents .***

$< CAP = 75^0$, $< BAQ = 65^0$

a) ***What is the measure of*** $< ABC$ **?**

b) ***What is the measure of*** $< ACB$ **?**

c) ***What is the measure of*** $< ACR$ **?**



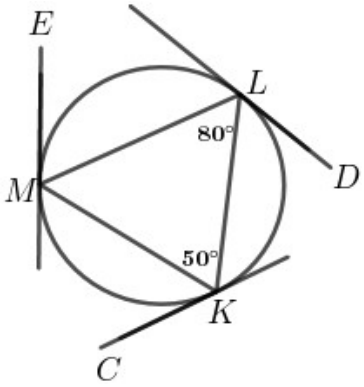
46 ***In the figure EM , CK and DL are tangents .***

$< KLM = 80^0$, $< LKM = 50^0$

a) ***What is the measure of*** $< CKM$ **?**

b) ***What is the measure of*** $< EML$ **?**

c) ***What is the measure of*** $< LMD$ **?**



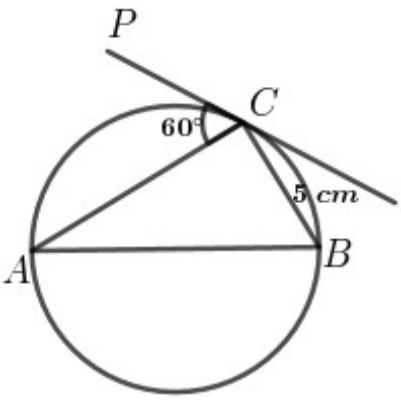
47 ***In the figure AB is the diameter of the circle .***

CP is a tangent . $BC = 5$ ***cm .***

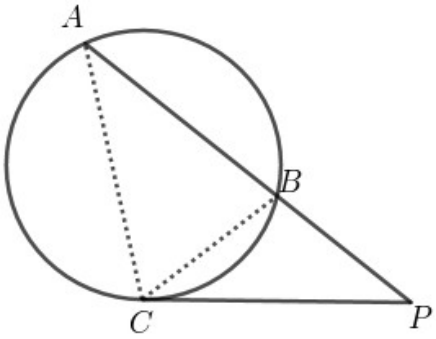
a) ***What is the measure of*** $< ACB$ **?**

b) ***What is the measure of*** $< ABC$ **?**

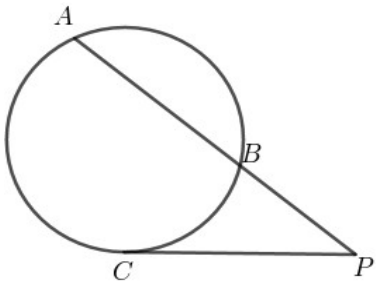
c) ***What is the diameter of the circle*** **?**



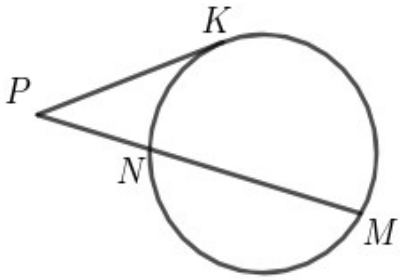
48	***In the figure chord AB is extended to meet the tangent through C at P .*** **a)** ***If*** **< BCP = x^0** ***, What is the measure of*** **< *BAC* ?** **b)** ***Prove that the angles of triangles APC and BPC are same*** **?** **c)** ***Prove that PA*** **x** ***PB*** **=** ***PC^2*** **?**



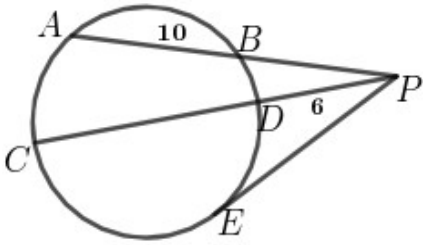
49	***In the figure chord AB is extended to meet the tangent through C at P .*** ***PA*** **= 9** ***cm*** **,** ***AB*** **= 5** ***cm*** **a)** ***What is the length of PB*** **?** **b)** ***What is the length of PC*** **?**



50	***In the figure chord MN is extended to meet the tangent through K at P .*** ***PK*** **= 8 cm** **,** ***PN*** **= 4 cm** **a)** ***PM*** **x** ***PN*** **= .....** **b)** ***What is the length of MN*** **?**



52	***In the figure two chords AB and CD are extended to meet the tangent through E at P .*** ***PA*** **= 18** ***cm*** **,** ***AB*** **= 10** ***cm*** **,** ***PD*** **= 6** ***cm*** **a)** ***What is the length of PB*** **?** **b)** ***PC*** **x** ***PD*** **= .....** **c)** ***What is the length of CD*** **?** **d)** ***What is the length of the tangent PE*** **?**



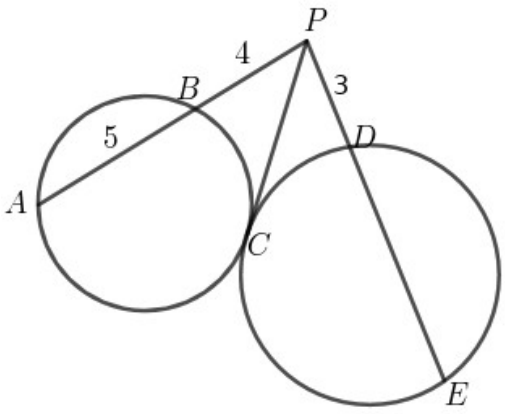
53 ***In the figure two circles intersect at C and CP is a common tangent to both the circles .***

AB = 5 cm , PB = 4 cm , PD = 3 cm

a) ***What is the length of PA ?***

b) ***What is the length of the tangent PC ?***

c) ***What is the length of DE ?***



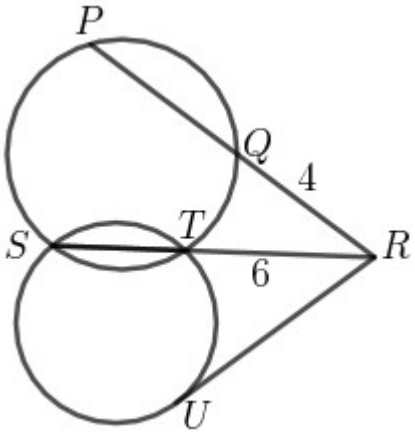
54 ***In the figure two circles intersect at S and T . RU is a tangent .***

PQ = 8 cm , QR = 4 cm , TR = 6 cm

a) ***What is the length of PR ?***

b) ***What is the length of RS ?***

c) ***What is the length of the tangent RU ?***



55 ***In the figure A and B are the centres of the circles and PQ is a common tangent . The distance between the centres of the circles is 15 cm . The radius of the smaller circle is 3 cm and radius of the larger circle is 6 cm .***

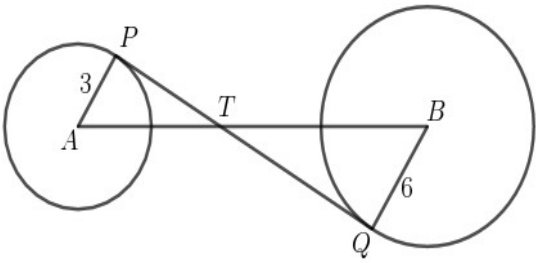
a) ***What is the measure of < APT ?***

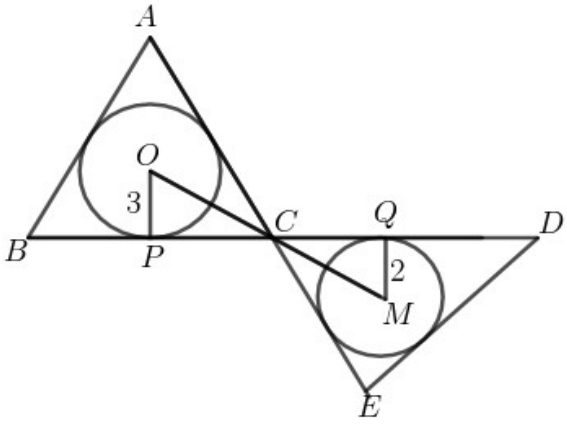
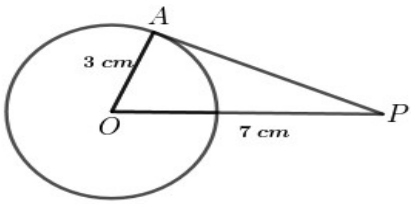
b) ***What is the measure of < BQT ?***

c) ***Prove that the angles of the triangles APT and BQT are same ?***

d) ***Prove that*** $\frac{AT}{BT} = \frac{1}{2}$ **?**

e) ***What is the length of the tangent PQ ?***



56	*In the figure ABC is an equilateral triangle . O is the centre of the incircle of the triangle ABC and M is the centre of the incircle of the triangle CDE .OP = 3 cm , MQ = 2cm* **a)** *What is the measure of < OPC ?* **b)** *What is the measure of < OCP ?* **c)** *What is the measure of < QCM ?* **d)** *What is the distance between the centres of the circles ?* 
57	*Draw a circle of radius 4 cm and mark a point on it . Draw a tangent through that point*
58	*In the figure O is the centre of the circle . AP is a tangent .* **a)** *What is the measure of < OAP ?* **b)** *Draw this figure in correct measurements .* 
59	*Draw a circle of radius 2.5 cm and mark a point 6 cm away from its centre. Draw the tangents to the circle from this point . Measure the length of the tangents .*
60	*Draw a circle of radius 3.5 cm and mark a point 8 cm away from its centre. Draw the tangents to the circle from this point .Measure the length of the tangents .*
61	*Draw a circle of radius 2.5 cm . Draw a triangle of angles 50º , 60º , 70º with all its sides touching the circle .*
62	*Draw a circle of radius 3 cm . Draw a triangle of angles 55º , 50º , 75º with all its sides touching the circle .*
	EXTRA QUESTIONS
63	*Draw a triangle of sides 3 cm , 4 cm , 6 cm . Draw its incircle and measure its radius*
64	*Draw a triangle of sides 4 cm , 6 cm , 7 cm . Draw its incircle and measure its radius*
65	*In the figure ,* < B = 90^0 . AB = f, BC = g , AC = h **a)** *What is the perimeter of the triangle ?* **b)** *What is the radius of the incircle of the triangle ?* **c)** *If the radius of the incircle is r , prove that the area of the triangle is r (r + h)*