



**Examination Preparation
Learning Resource
2018**

MATHEMATICS

GRADE 11

WINTER SCHOOL INTERVENTION PROGRAM

TOPIC: EUCLIDEAN GEOMETRY

LEARNER WORKSHEET

NAME: _____

M Muhamad

Desiree Mare

Senior Mathematics Specialist

D12 Subject Advisor

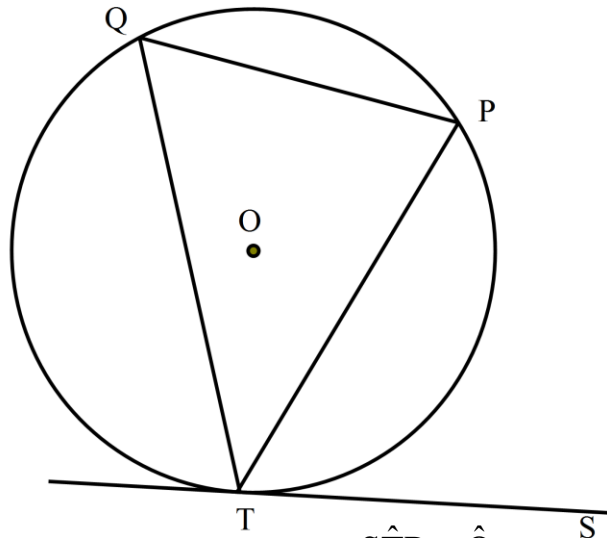
E-mail: mumu.muhamad@yahoo.com

E-mail: desiree.mare@gauteng.gov.za

DISCUSSION WILL BE OPEN

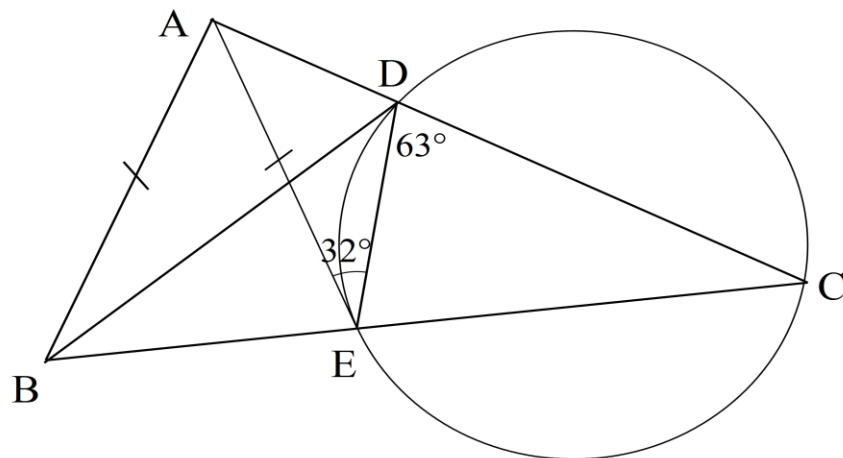
QUESTION 1

1.1 O is the centre of the circle, and ST is a tangent to the circle at T.



Use the diagram to prove the theorem which states that $\hat{S}TP = \hat{Q}$. (5)

1.2 CD and CE are produced to A and B respectively so that AE is a tangent to the circle and $AB = AE$. $\hat{A}ED = 32^\circ$ and $\hat{C}DE = 63^\circ$.



1.2.1 Calculate, giving reasons, the size of

a) \hat{C}

(2)

b) \hat{AEB}

(2)

1.2.2 Prove that ABED is a cyclic quadrilateral.

(3)

1.2.3 Prove that AB is a tangent to the circle through B, D and C.

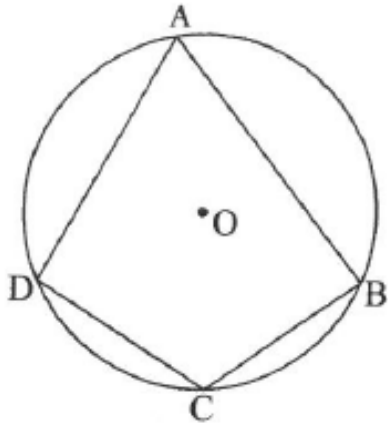
(3)

1.2.4 Calculate, giving reasons, the size of \hat{BDE} .

(2)

QUESTION 2

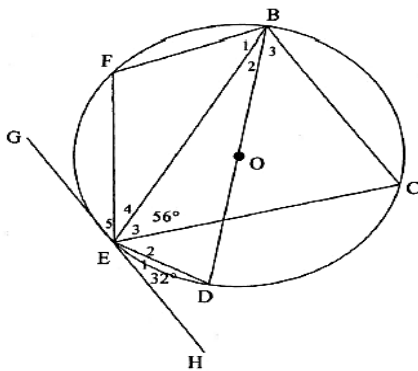
(a) In the figure below A, B, C and D are points on the circumference of the circle centre O.



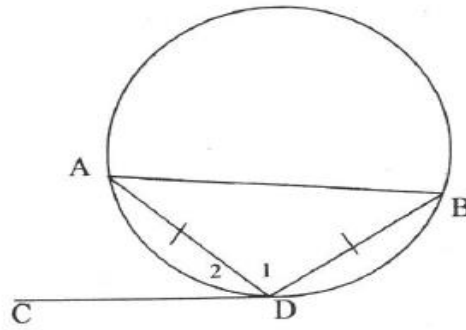
(i) What type of quadrilateral is ABCD? (1)

(ii) Using the above diagram, prove the theorem which states that $\hat{A} + \hat{C} = 180^\circ$ (4)

(b) In the diagram below, O is the centre of the circle. BD is a diameter of the circle.



(i) \hat{E}_2



(2)

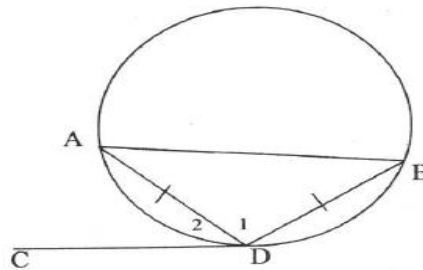
(ii) $E\hat{B}C$

(3)

(iii) \hat{F}

(4)

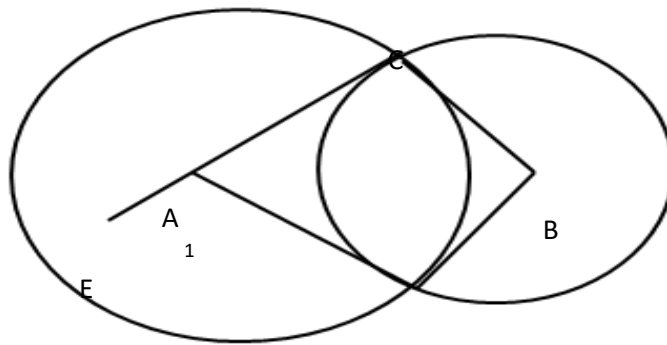
(a) $\widehat{ADB} = 3x$,
 $\widehat{ADC} = x - 25^\circ$.
 Given $AD = DB$



Determine, with reasons, the numerical value(s) of x for which CD is a tangent to the circle.

(5)

- (b) Two circles, centres A and B intersect at C and D. CA is produced to point E. AC and AD are tangents to the smaller circle at C and D respectively.



Prove $\hat{A}_1 = \hat{C} \hat{B} D$

D

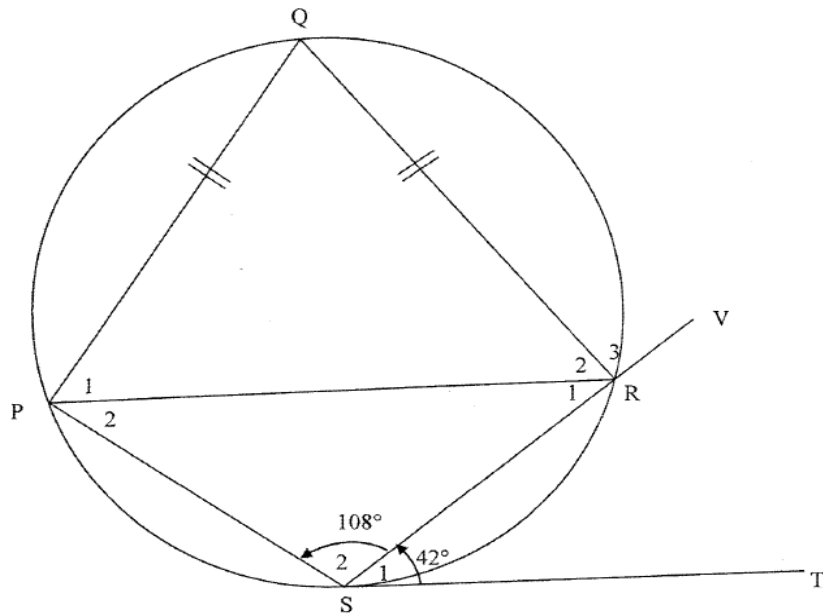
(5)

(Hint: you will need to draw in lines to 'complete' the diagram. With the addition of these lines, you will be able to make use of the facts that:

- ✓ EC and AD are tangents
- ✓ \hat{B} is the centre of the smaller circle.)

QUESTION 4

In the diagram below, PQRS is a cyclic quadrilateral. ST is a tangent to the circle at S. $PQ = QR$, $\hat{S}_1 = 42^\circ$ and $\hat{S}_2 = 108^\circ$.



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

4.1 \hat{Q} (2)

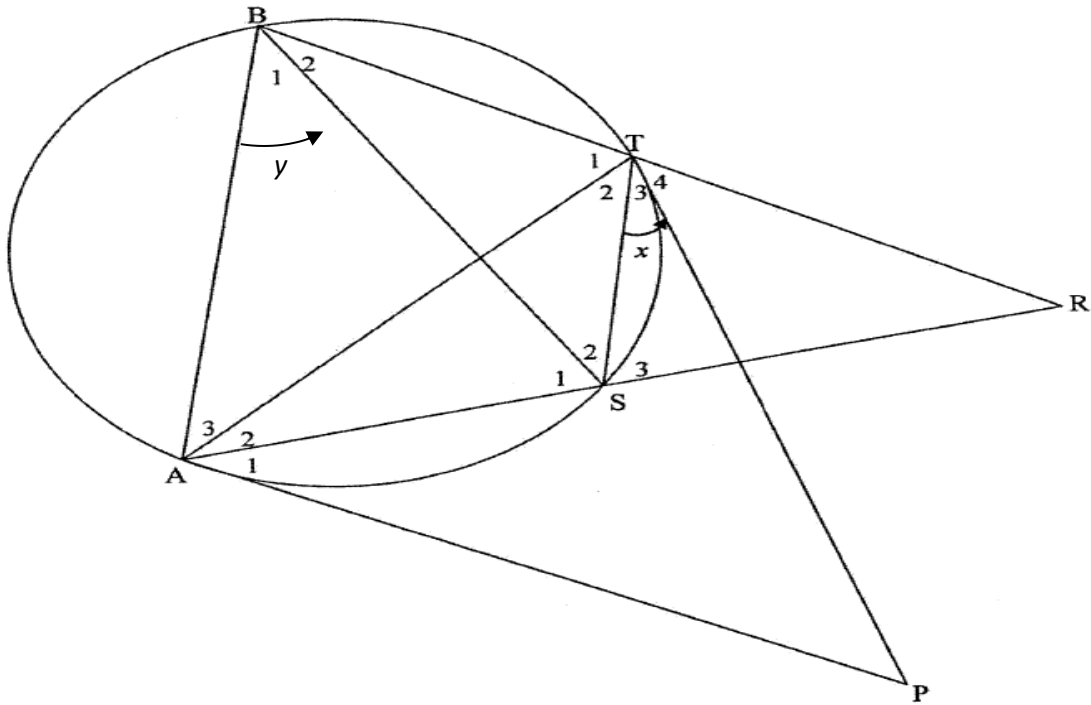
4.2 \hat{R}_2 (2)

4.3 \hat{P}_2 (2)

4.4 \hat{R}_3 (2)

QUESTION 5

In the diagram below, PA and PT are tangents to a circle at A and T respectively. B and S are points on the circle such that BT produced and AS produced meet at R and $BR = AR$. BS, AT and TS are drawn. $\hat{T}_3 = x$ and $\hat{B}_1 = y$.



5.1 Give a reason why $\hat{T}_3 = \hat{A}_2 = x$. (1)

5.2 Prove that:

5.2.1 $AB \parallel ST$ (5)

$$5.2.2 \quad \hat{T}_4 = \hat{A}_1 \quad (4)$$

5.2.3 RTAP is a cyclic quadrilateral (2)
