



Education and Sport Development

Department of Education and Sport Development

Departement van Onderwys en Sportontwikkeling

Lefapha la Thuto le Tlhabololo ya Metshameko

NORTH WEST PROVINCE

PROVINCIAL ASSESSMENT

GRADE 11

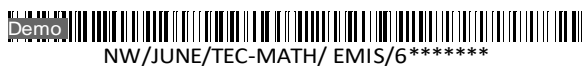
TECHNICAL MATHEMATICS P2

JUNE 2019

MARKS: 100

TIME: 2 hours

This question paper consists of 10 pages, 1 data sheets and 1 graph paper.

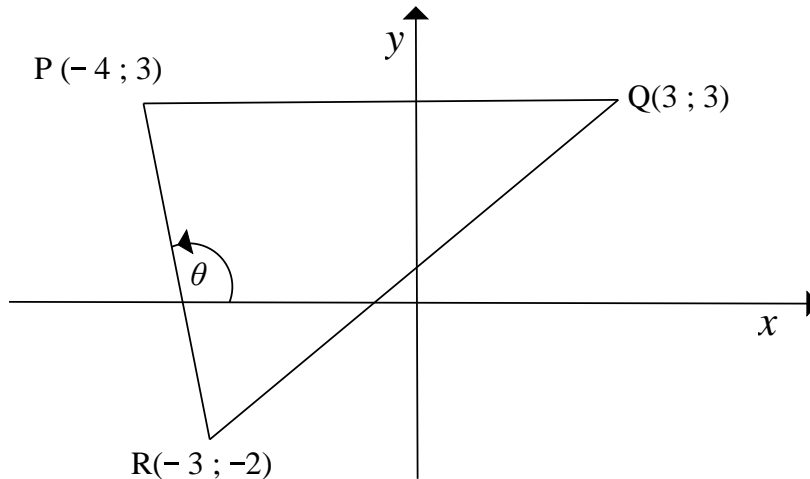


INSTRUCTIONS AND INFORMATION

1. This question paper consist of 7 questions. Answer ALL the questions.
2. Clearly show ALL calculations, diagrams, graphs, et cetera that you have used in determining the answer.
3. An approved scientific calculator (non-programmable and non-graphical) may be used, unless stated otherwise.
4. If necessary, answers should be rounded off to TWO decimal places, unless stated otherwise.
5. Diagrams are NOT necessarily drawn to scale.
6. Number the answers correctly according to the numbering system used in this question paper.
7. Write neat and legibly.

QUESTION 1

In the figure below, $P(-4; 3)$, $Q(3; 3)$ and $R(-3; -2)$ are vertices of $\triangle PQR$

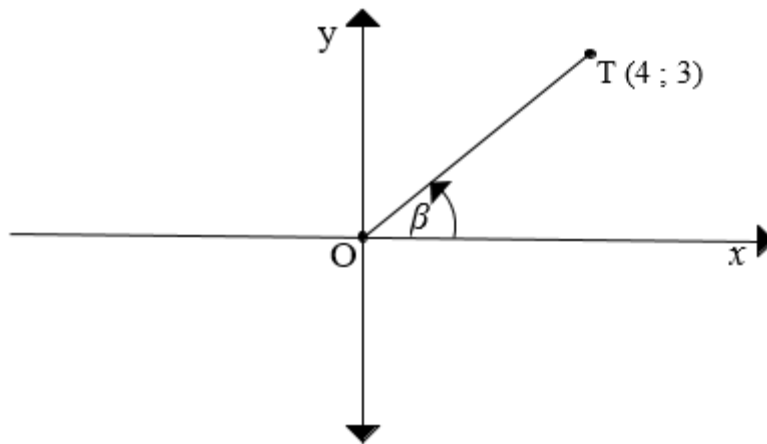


- 1.1 Write the equation of PQ (1)
- 1.2 Determine the coordinates of the M, the midpoint of QR (2)
- 1.3 Determine the size of θ (4)
- 1.4 Hence calculate the size of \hat{R} (4)
- 1.5 If line is drawn passing through M, perpendicular to QR, determine the equation of this line. (4)
- 1.6 Determine the equation of the straight line PR (3)
- 1.7 Is line PR \parallel PQ? Give a reason (2)

[20]

QUESTION 2

- 2.1 In the diagram below, T(4;3) is a point on the Cartesian plane with origin O(0;0). The reflex angle that is formed by OP with the positive x-axis is β .



Determine, without using a calculator, the value of each of the following:

- 2.1.1 the length of OT. (3)
- 2.1.2 $5\cos\beta - 4\tan\beta$ (3)
- 2.1.3 $\operatorname{cosec}\beta$ (2)
- 2.1.4 $\cot\beta$ (2)
- 2.1.5 $\sec^2\beta$ (2)
- 2.2 If $p = 62^\circ$ and $q = 28^\circ$, use a calculator to find the value of the following
- 2.2.1 $\sin(p + q)$ (2)
- 2.2.2 $5\cos q + \frac{\sin p}{2}$ (2)

[16]

QUESTION 3

Consider the functions defined by:

$$f(x) = \tan x \text{ and } g(x) = 2\cos x \text{ for } x \in [0; 360]$$

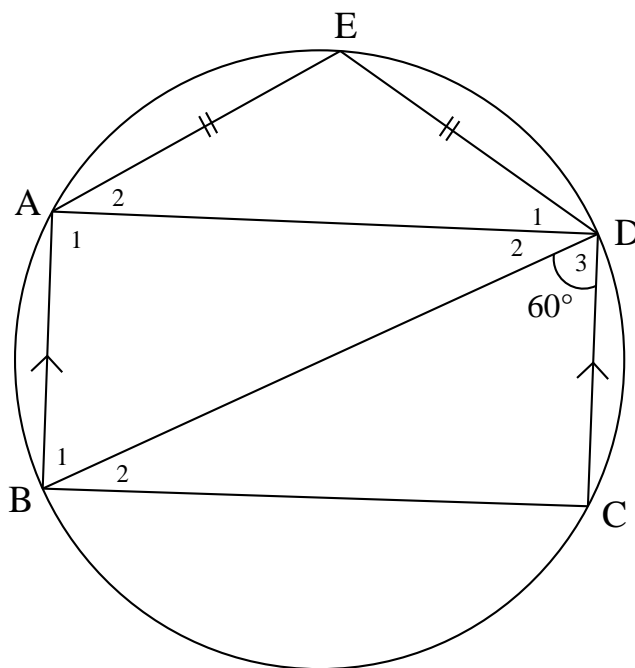
- 3.1 Use the DIAGRAM SHEET provided to draw sketch graphs of f and g on the set of axes. (5)
- 3.2 What is the period of f and g (2)
- 3.3 Write down the amplitude of g (1)
- 3.4 Write down the range of g (2)

[10]

QUESTION 4

4.1 Complete the sentence:

4.1.1 The opposite angles of a cyclic quadrilateral... (1)

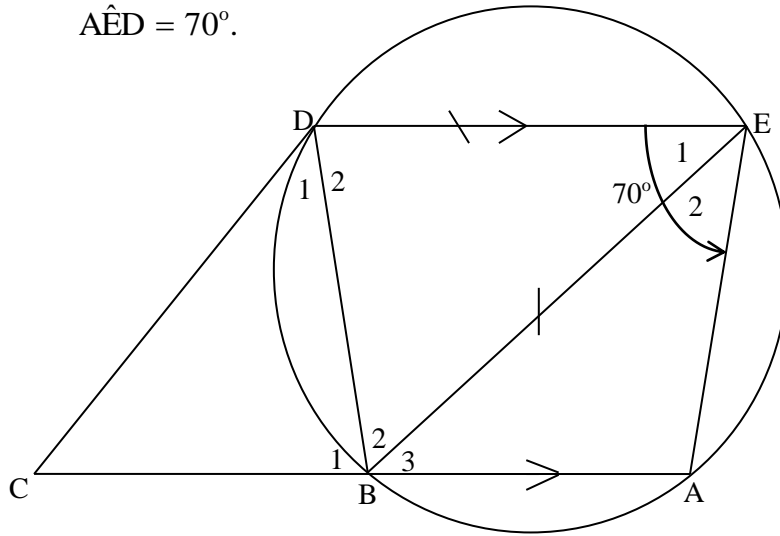
4.1.2 A line drawn from the center of a circle perpendicular to chord
..... the chord (1)4.2 In the diagram below, BD is a diameter of a circle. $BA \parallel CD$, $AE = ED$
and $\hat{D}_3 = 60^\circ$ 

Complete the following table:

Statement	Reason
4.2.1 $\hat{C} = 90^\circ$... (1)
4.2.2 $\hat{B}_1 = \dots$... (2)
4.2.3 $\hat{E} + \hat{B}_1 = \dots$... (2)
4.2.4 $\hat{D}_1 = \dots$... (2)

- 4.3 In the diagram below, BAED is a cyclic quadrilateral with $BA \parallel DE$. $BE = DE$ and The tangent to the circle at D meets AB produced at C.

$$\hat{AED} = 70^\circ.$$



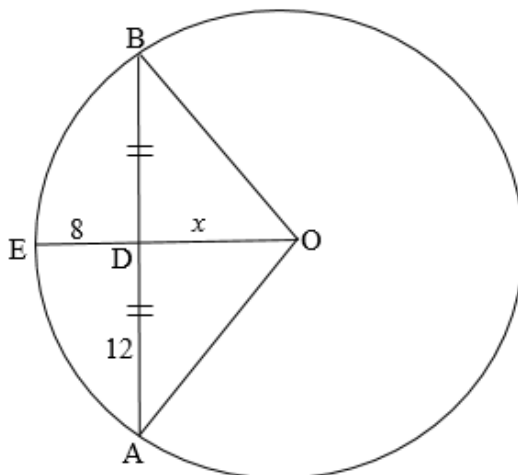
Calculate, with reasons the size of the following angles.

- 4.3.1 \hat{A} (2)
 4.3.2 \hat{B}_1 (2)
 4.3.3 \hat{D}_2 (2)
 4.3.4 \hat{B}_2 (2)
 4.3.5 \hat{D}_1 (3)

[20]

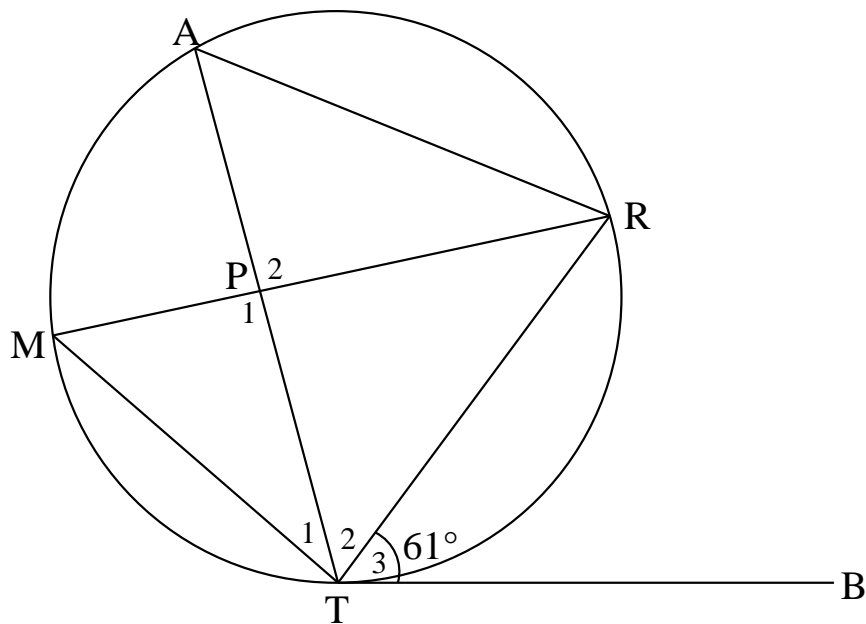
QUESTION 5

- 5.1 AB is a chord to a circle with center O. OE bisect AB. AD = 12, ED = 8 and OD = x



- 5.1.1 Determine the radius OB in terms of x (1)
 5.1.2 Hence calculate the length of the radius OB (4)

- 5.2 In the diagram below, RAMT is a cyclic quadrilateral. TB is a tangent to the circle at a point T with $\angle RTB = 61^\circ$



- 5.2.1 Determine, giving reasons, the magnitude of the following angles:

(a) $\angle A$ (2)

(b) $\angle M$ (2)

- 5.2.2 Why is $\angle P_1 = \angle P_2$ (1)
[10]

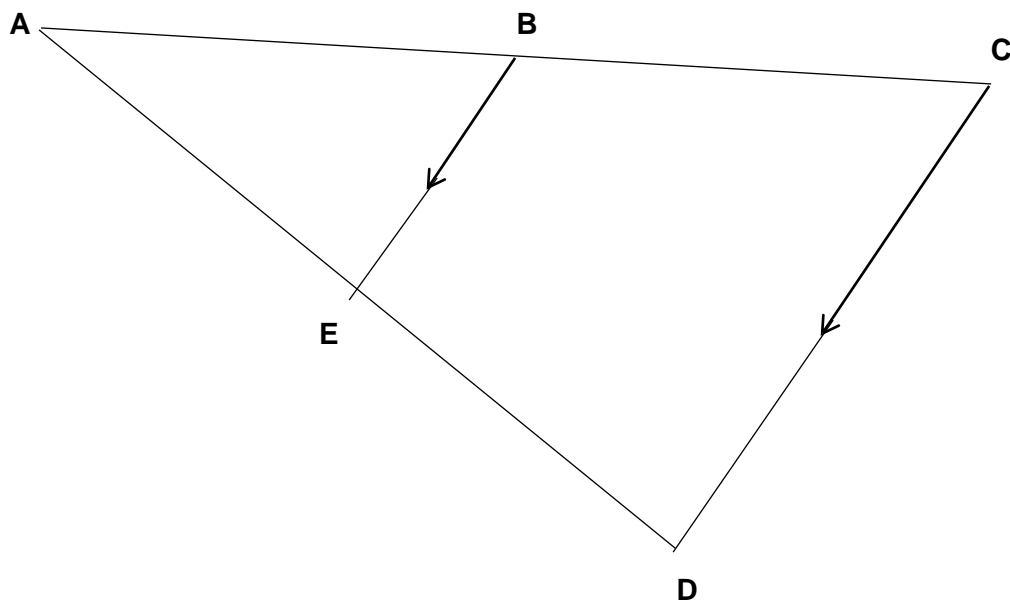
QUESTION 6

- 6.1 Convert 160° to radians (1)
- 6.2 Convert $\frac{\pi}{60}$ to degrees (1)
- 6.3 Convert $134,251^\circ$ to degrees, minutes and seconds (2)
- 6.4 Convert $27^\circ 36' 54''$ to decimal degree correct to 3 decimal places. (2)
- 6.5 Add $\frac{\pi}{2} + \frac{7\pi}{3}$ and give the answer in degrees. (4)
- 6.6 Calculate the value of $\sin \pi + \cos \frac{\pi}{4}$ (4)

[14]

QUESTION 7

In the diagram below $DC \parallel EB$ and $DC = 9$ units and $EB = 6$ units.



7.1 If $AC = 24$ units, how long is AB ? (5)

7.2 If $AE = 10$ units, how long is ED ? (5)

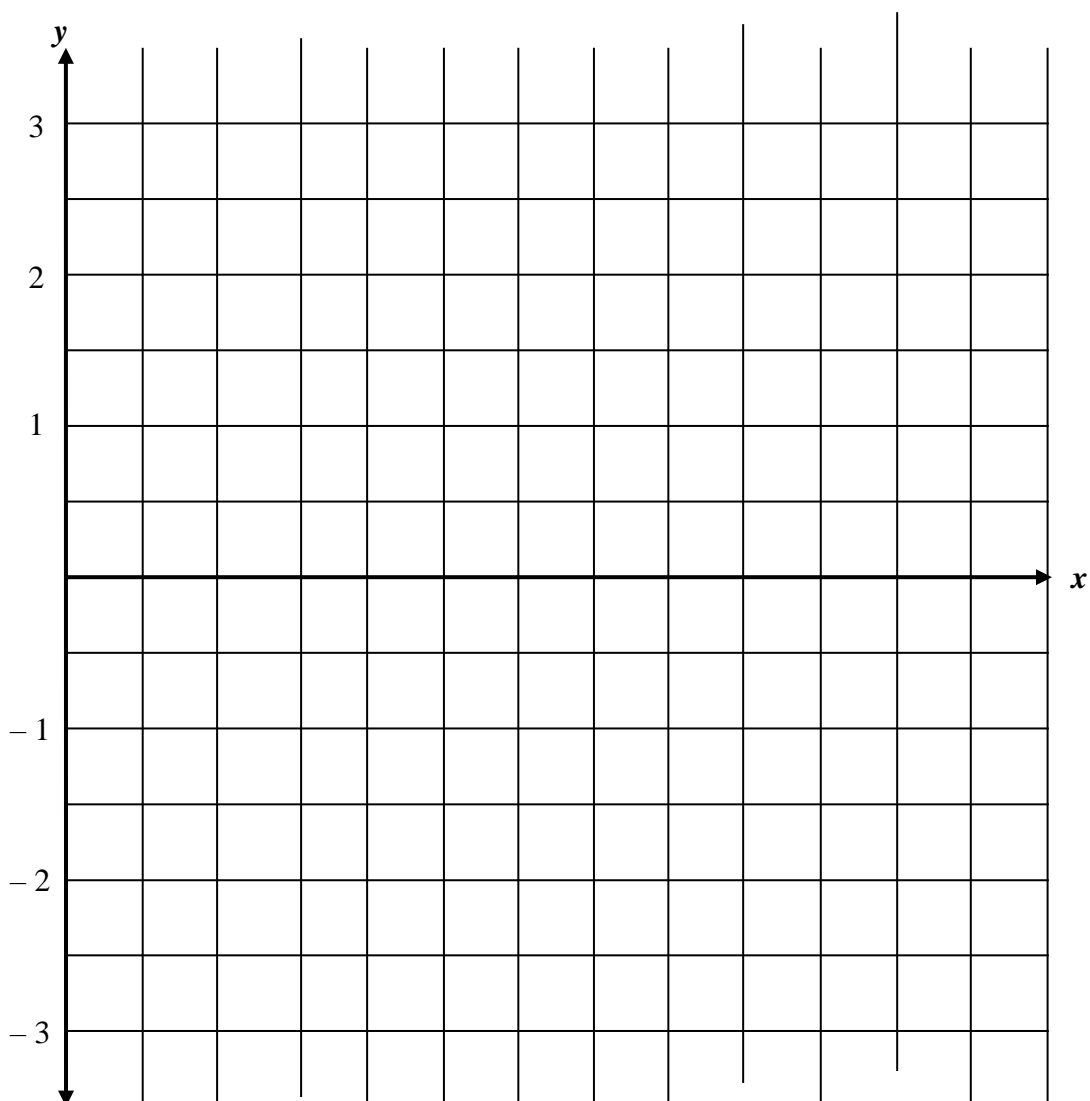
[10]

TOTAL: 100

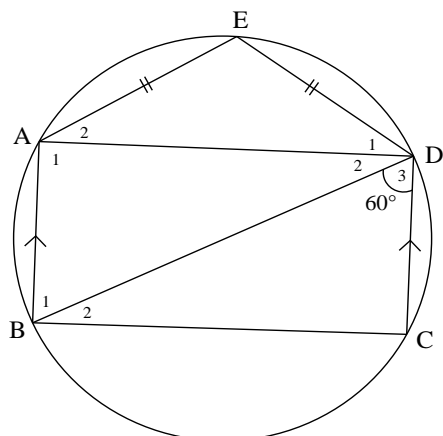
DIAGRAM SHEET

NAME:

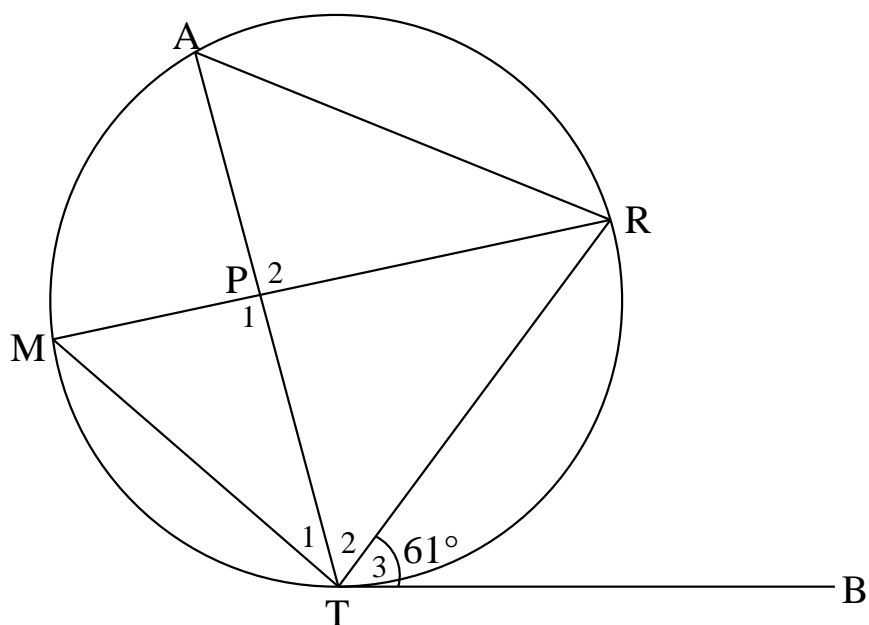
CLASS:



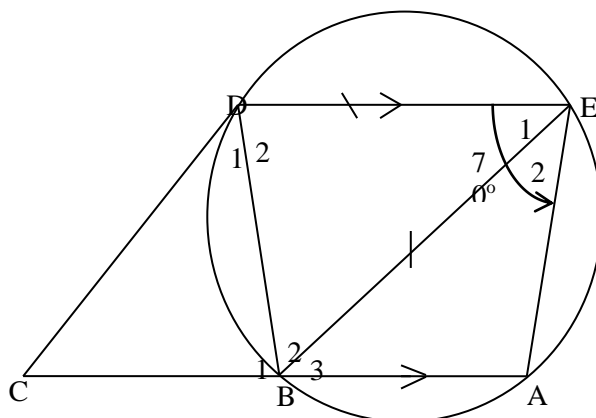
NAME:
QUESTION 4.2



QUESTION 5.1



CLASS:
QUESTION 4.3



QUESTION 5.2

