Education and Sport Development

Department of Education and Sport Development
Departement van Onderwys en Sport Ontwikkeling
Lefapha la Thuto le Tlhabololo ya Metshameko
NORTH WEST PROVINCE

GRADE 10

MATHEMATICS PAPER 2

MID-YEAR EXAMINATION 2018

MARKS: 75

TIME: 1 hour 30 minutes

This question paper consists of 6 pages and 2 diagram sheets

NW/JUNE/MATH/ EMIS/6*******

INSTRUCTIONS AND INFORMATION

1. This question paper consists of 6 questions Answer ALL the questions.
2. Clearly show ALL calculations, diagrams, graphs, et cetera that you have used in determining the answers.
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. It is in your own interest to write legibly and to present the work neatly.

QUESTION 1

1.1 Use your calculator to find the value of the following, if $\theta = 47{,}5°$ and $\alpha = 50{,}3$:

$\sin\theta + \sec\alpha$ (3)

1.2 Use your calculator to find the value of *x*, where *x* is an acute angle:

1.2.1 $2\sin x = 2$ (2)

1.2.2 $\cos(x - 11°) + 1 = 1{,}79$ (3)

1.3 Evaluate the following **without a calculator**. All working must be shown.

1.3.1 $\sqrt{24 + \tan^2 45°}$ (2)

1.3.2 $\dfrac{\sin 60° \cdot \sec 60° \cdot \cot 30° \cdot}{\cos 45°}$ (5)

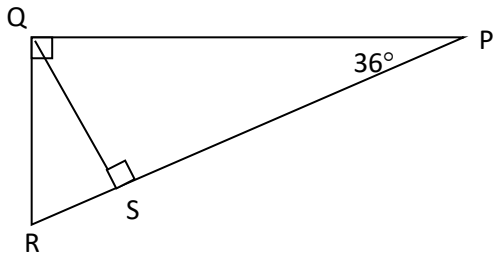
[15]

QUESTION 2

2.1 If $5\tan\theta = -12$ and $90° \leq \theta \leq 270°$, **use a sketch** to determine the value of $\cos\theta - \sin\theta$ (**Without the use of a calculator**).

(5)

2.2 With reference to the figure below:



2.2.1 Write down two ratios for *cos* 36° in terms of the sides of the triangles. (2)

2.2.2 If *PS* = 9,5 cm, calculate the value of *QS*. (4)

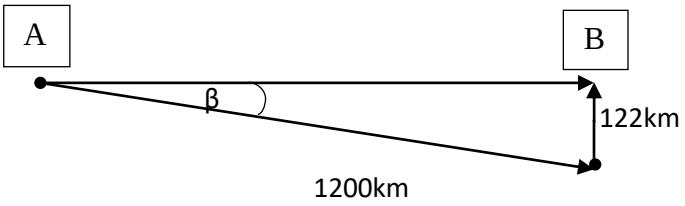
2.2.3 Complete by filling in the missing trigonometric ratio

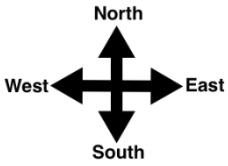
……54° $= \dfrac{SP}{QP}$. (1)

[12]

QUESTION 3

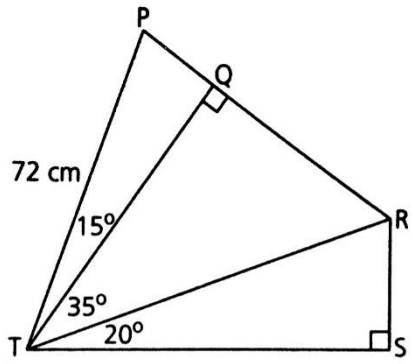
3.1 A jet is scheduled to fly due east from airport A to airport B. After flying 1200km the pilot still does not have the second airport in view and her instruments show that she is in fact 122 km directly south of her destination. Calculate how many degrees off course (β) the pilot flew during the trip (to the nearest degree).





(3)

3.2 In the diagram below: PT = 72cm; TQ ⊥ PR, $P\hat{T}Q = 15°; Q\hat{T}R = 35°$



3.2.1 Calculate the length of QT. (3)

3.2.2 Calculate the length of TR. (3)

[9]

QUESTION 4

4.1. Use the grid on the attached diagram sheet and draw the following graphs:
$f(x) = 2\sin x$ *and* $g(x) = \cos x + 1,\ x \in [0^0; 360^0]$ (6)

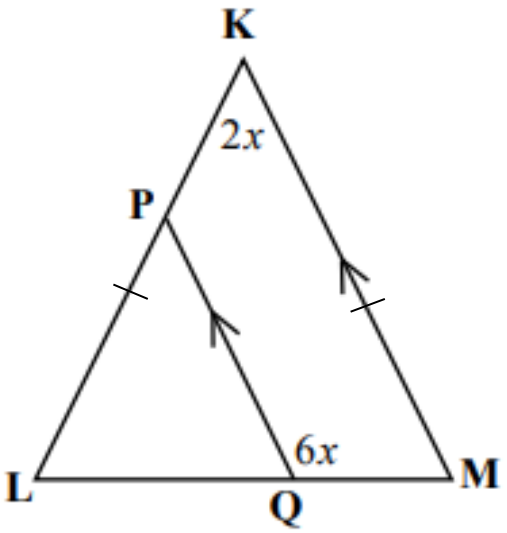
4.2 For which values of x will $g(x) \geq 0$? (2)

4.3 Write down the range of g. (2)

[10]

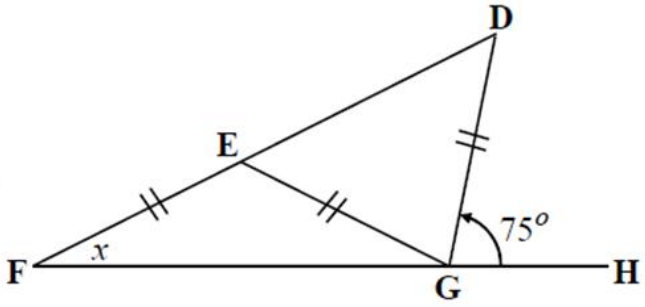
QUESTION 5

5.1 In the diagram below PQ // KM and KL=KM, $\hat{K} = 2x$ *and* $P\hat{Q}M = 6x$



Determine the value of *x* (7)

5.2 In the diagram given alongside, FD and FH are straight lines,
GD = EG = FE, $D\hat{G}H = 75^0$ $\hat{F} = x$.



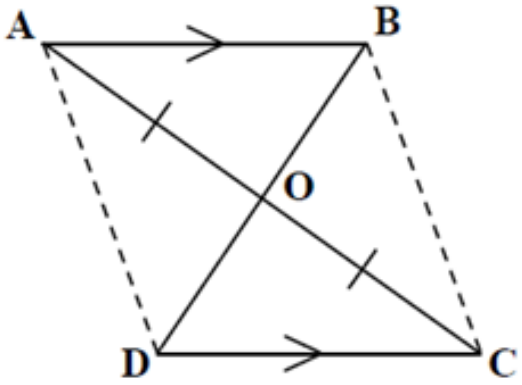
5.2.1 Name another angle equal to *x*, giving a reason for your answer. (2)

5.2.2 Determine the value of *x*. (5)

[14]

QUESTION 6

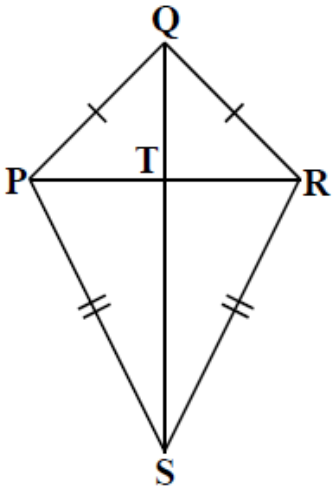
6.1 In the diagram given below, AC and BD are straight lines, AO = OC and AB // DC.



6.1.1 Prove, by congruency, that AB = DC. (6)

6.1.2 Explain why quadrilateral ABCD is a parallelogram. (2)

6.2 Consider the diagram alongside. It shows kite PQRS, in which PQ = QR and PS = SR. The diagonals of the kite intersect at T. PQ = 10 cm, PR = 16 cm and QS = 21 cm.



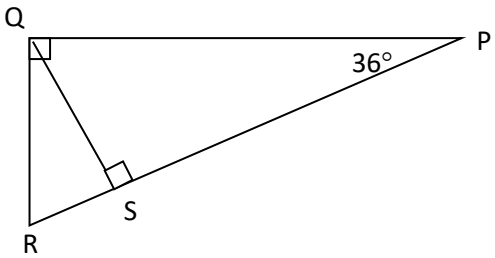
Determine the perimeter of the kite. **Show all your workings**. (7)

[15]

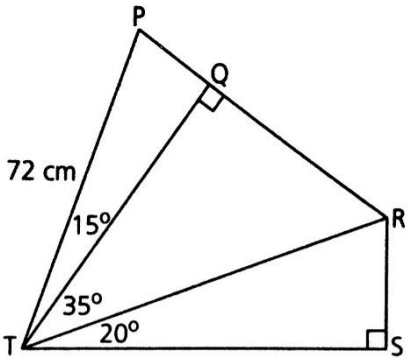
DIAGRAM SHEET

Name: _____

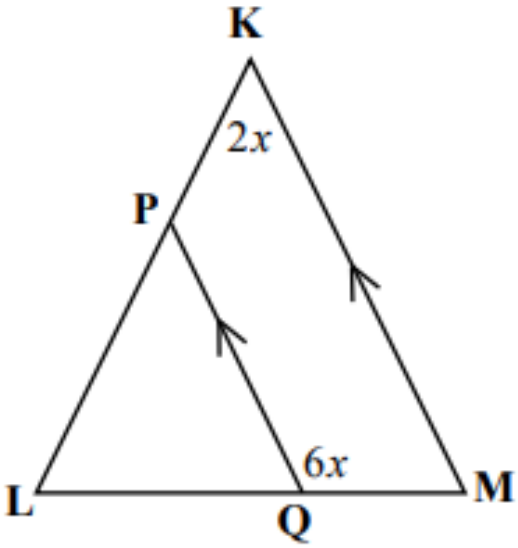
2.2



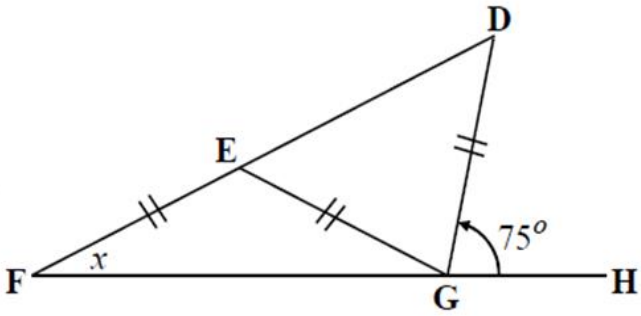
3.2



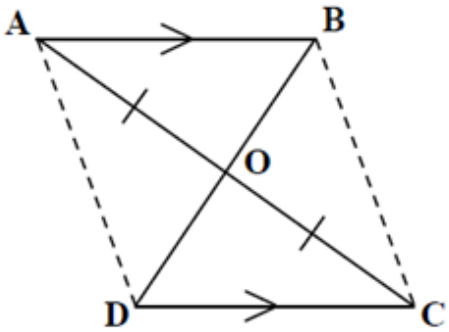
5.1



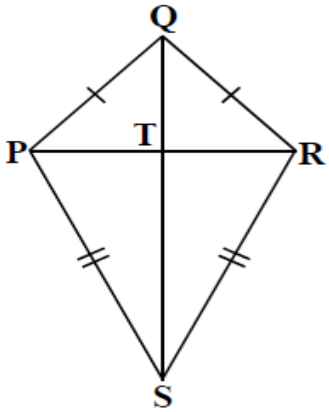
5.2



6.1



6.2



QUESTION 4