education

Department:
Education
PROVINCE OF KWAZULU-NATAL

NATIONAL
SENIOR CERTIFICATE

GRADE 10

MATHEMATICS P2

COMMON TEST

JUNE 2019

MARKS: **50**

TIME: **1 hour**

This question paper consists of 6 pages.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1.   This question paper consists of 3 questions.

2.   Answer ALL the questions.

3.   Clearly show ALL calculations, diagrams, graphs, etc. which you have used in determining your answers.

4.   Answers only will NOT necessarily be awarded full marks.

5.   You may use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.

6.   If necessary, round off answers correct to TWO decimal places, unless stated otherwise.

7.   Diagrams are NOT necessarily drawn to scale.

8.   Write neatly and legibly.

QUESTION 1

In the diagram below P (2 ; 9), A, R (n ; –13) and M are the vertices of parallelogram PARM.

PMT is a straight line such that M is the midpoint of PT.

T (10 ; − 3) is a point such that PT ⊥ RT.
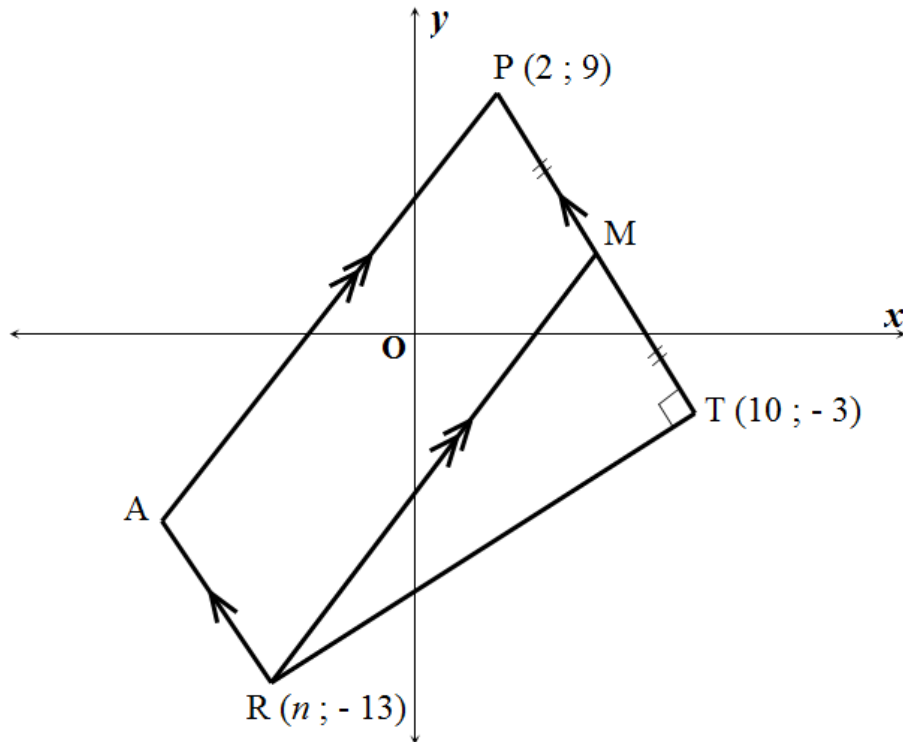
1.1   Determine:

1.1.1   the length of PT. Leave your answer in surd form.   (2)

1.1.2   the gradient of PT   (2)

1.1.3   the gradient of AR   (1)

1.1.4   the coordinates of M   (2)

1.2   Determine the equation of PM in the form $y = mx + c$ (3)

1.3   Show that $n = -5$ (4)

1.4   Calculate the area of ΔRMT   (4)

                                                                                [18]

QUESTION 2

2.1   Given that $\alpha = 24,6°$ and $\beta = 132,7°$ calculate the value of the following
           (correct to TWO decimal places):

2.1.1 $\dfrac{1}{2}\cos\alpha$ (1)

2.1.2 $\cos ec2\beta$ (2)

2.2   Various options are provided as possible answers to the following questions.
           Choose the correct answer and write only the letter (A – D) next to the question number, for
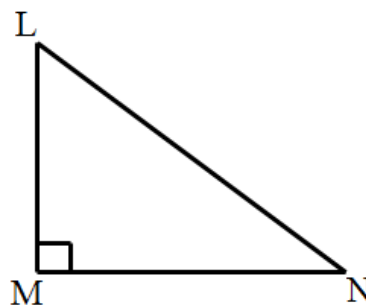   example: **2.2.4 A**

2.2.1   In the diagram below of right angle triangle EFG, EF = 17cm and FG = 15cm.
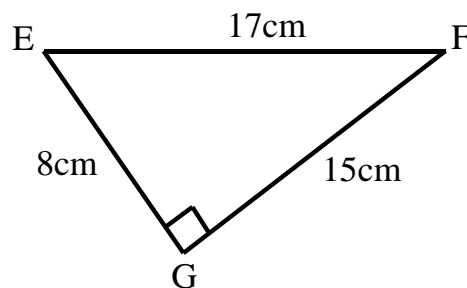
           Which trigonometric equation could be used to determine the value of angle E?

           A. $\sin E = \dfrac{17}{15}$ B. $\cos E = \dfrac{15}{17}$

           C. $\tan E = \dfrac{15}{8}$ D. $\sin E = \dfrac{8}{17}$ (1)

2.2.2   In the diagram below scalene $\triangle LMN$ shown, $\hat{M} = 90°$.

           Which of the following statements is always true?

           A. $\sin L = \cos L$ B. $\sin L = \cos N$ (1)

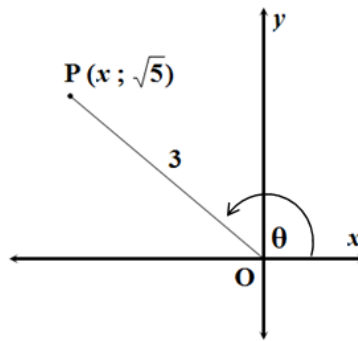   C. $\cos L = \cos M$ D. $\sin L = \cos M$

2.3   Simplify the following **WITHOUT** the use of a calculator:

$$\sin^2 45° + \cos^2 45°$$

(2)

2.4   Solve for x, correct to ONE decimal place, where $0° \leq x \leq 90°$:

$$\sin 2x = 0,291$$

(2)

2.5   In the diagram $P\left(x ; \sqrt{5}\right)$, is a point in the Cartesian plane and $P\hat{O}X = \theta$.
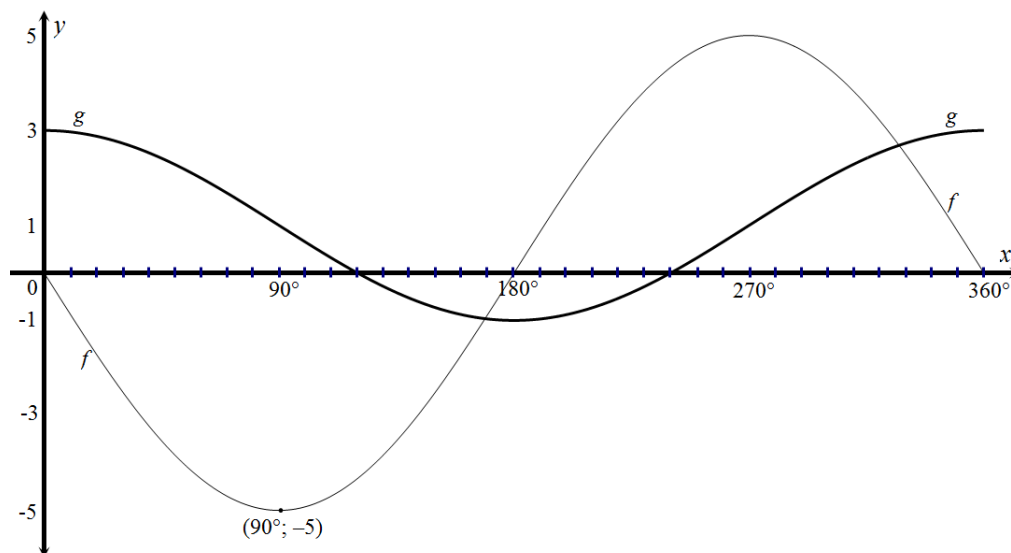

Using the diagram and **without the use of a calculator**, determine:

2.5.1   the value of x (2)

2.5.2 $\cos \theta$ (2)

2.5.3 $1 - \sin^2 \theta$ (2)

2.6   Sketched below are the graphs of $f(x) = a\sin x$ and $g(x) = \cos x + b$ for $x \in [0°; 360°]$

2.6.1   Write down the values of a and b (2)

2.6.2   Write down the period of f (1)

2.6.3   Determine the range of g (1)

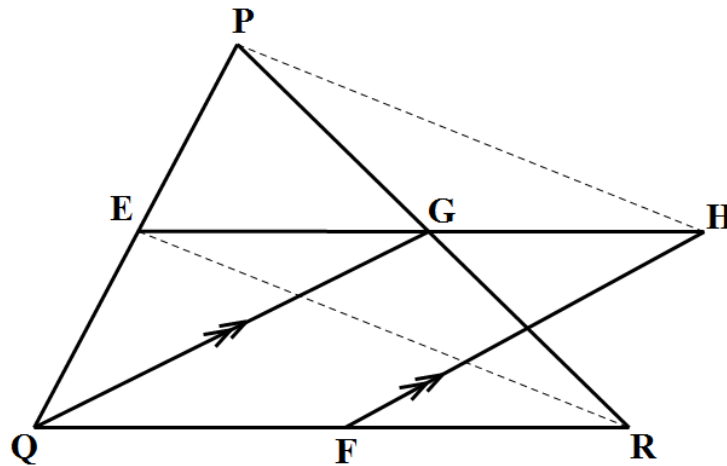2.6.4   For which value(s) of x is $g(x) < 0$?   (2)

[21]

QUESTION 3

3.1   Complete the following:

        The line joining the mid-points of two sides of a triangle is ……. to the third side and equal
        to ……. the length of the third side.   (2)

3.2   In the diagram below, ΔPQR has E, F and G the midpoints of PQ, QR and PR
        respectively. $QG \parallel FH$.

        Prove:

        3.2.1 $QGHF$ is a parallelogram   (3)

        3.2.2 $EG = GH$ (3)

        3.2.3 $ER \parallel PH$ (3)
                                                                                                    [11]

                                                                            TOTAL: 50