



EXAMINATIONS COUNCIL OF ESWATINI
Eswatini General Certificate of Secondary Education

CANDIDATE
NAME

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CENTRE
NUMBER

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CANDIDATE
NUMBER

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MATHEMATICS

6880/02

Paper 2 Calculator Structured Questions (Core and Extended)

October/November 2019

2 hours

Candidates answer on the Question Paper.

Additional Materials: Electronic calculator
 Geometrical Instruments
 Mathematical tables (optional)
 Tracing paper (optional)

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on the spaces provided above, and on all the work you hand in.

Write in dark blue or black pen.

You may use a soft pencil for any diagrams or graphs.

Do **not** use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.

If working is needed for any question it must be shown below that question.
The number of marks is given in brackets [] at the end of each question or part question.

Electronic calculators should be used.

If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures.

Give answers in degrees to one decimal place.

For π , use either your calculator value or 3.142.

The total of the marks for this paper is 90.

For Examiner's Use

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Total	

This document consists of **15** printed pages and **1** blank page.

- 1 (a) Find $12\frac{1}{2}\%$ of 2.

Write your answer as a fraction in its simplest form.

Answer (a) [2]

- (b) Write the percentage below as a decimal number.

122%

Answer (b) [1]

- (c) Put in the sign $<$, $>$ or $=$ in the following:

33% $\frac{1}{3}$ [1]

- 2 (a) List

- (i) all the factors of 30.

Answer (a)(i) [2]

- (ii) the first four multiples of 7.

Answer (a)(ii) [2]

- (b) Describe the set of numbers $\{1, 4, 9, 16, \dots\}$

Answer (b) [1]

- (c) Vumi wrote this list as the first six prime numbers.

1 3 5 7 9 11

Which of these numbers are incorrect?

Answer (c) [2]

3 Write down the correct mathematical term or expression for each of the following:

(a) Two lines that never meet.

Answer (a) [1]

(b) An angle used to describe the direction from one place to another.

Answer (b) [1]

(c) A triangle with all sides equal.

Answer (c) [1]

(d) Figures of the same size and shape.

Answer (d) [1]

(e) An angle which is more than 180° but less than 360° .

Answer (e) [1]

4 (a) Simplify completely

(i) $t^2 \times t^3 \times t^{-4}$,

Answer (a)(i) [2]

(ii) $\frac{6m^2n^2}{3mn^5}$,

Answer (a)(ii) [2]

(b) Expand $ab(ab^2 + a^2b)$.

Answer (b) [2]

(c) Expand the brackets and simplify $(4x - 1)(2x - 3)$.

Answer(c) [2]

- 5 The time-table shows the times of 2 buses that travel from village *P* to village *Q* to village *R*.

There are only two buses for this route.

Bus number		B1	B2
Village <i>P</i>	departure	13 30	14 15
Village <i>Q</i>	arrival	15 00	15 45
	departure	15 30	16 15
Village <i>R</i>	arrival	16 15	17 00

- (a) For how long does bus B2 stop in Village *Q*?

Answer (a) minutes [1]

- (b) For how long is bus B1 travelling on the roads from Village *P* to Village *R*?

Answer (b) hours minutes [2]

- (c) A passenger arrives at the Village *Q* bus stop at 15 32.

How long must he wait until the next bus departs for Village *R*?

Answer (c) minutes [1]

- 6 (a) Three boys were in the same class and recorded their test scores in Mathematics Paper 1 and Biology Paper 1.

Anele got 48 in Mathematics and 63 in Biology.
Dolla got 57 in Mathematics and 70 in Biology.
Lwethu got 38 in Mathematics and 66 in Biology.

Represent this information in a 2 by 3 matrix.

[2]

- (b) The marks for the three boys in Mathematics Paper 2 and Biology paper 2 are as follows.

Anele got 51 in Mathematics and 68 in Biology.
Dolla got 57 in Mathematics and 49 in Biology.
Lwethu got 41 in Mathematics and 52 in Biology.

Represent their **total** marks for each subject in a matrix.

[2]

- (c) A bag contains 10 balls.

Four of the balls are red and six are blue.
Five balls are picked from the bag at random without replacement.

- (i) What is the probability that all five of them are red?

Answer (c)(i) [1]

- (ii) Explain your answer to (c)(i).

Answer (c)(ii)

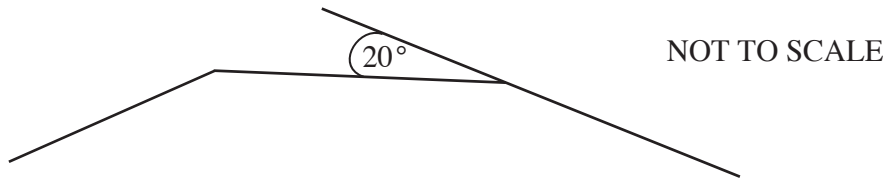
.....[1]

- (d) The probability that Sipho passes a Science test is 0.83.

Find the probability that Sipho fails the Science test.

Answer (d) [1]

- 7 (a) The diagram shows part of a regular polygon with one side extended.



Calculate the

- (i) size of each interior angle for this polygon.

Answer (a)(i) ° [1]

- (ii) number of sides of the polygon.

Answer (a)(ii) [2]

- (iii) sum of the interior angles of the polygon.

Answer (a)(iii) [1]

- (b) (i) Construct parallelogram $PQRS$ given that $PQ = 9$ cm, $QR = 6$ cm and angle $PQR = 110^\circ$, using your protractor, ruler and set square.

[3]

- (ii) Measure and write down the length of diagonal PR .

Answer (b)(ii) cm [1]

8 (a) You are given that $\begin{pmatrix} 3 & 2 \\ 2 & 1 \end{pmatrix} + 3 \mathbf{A} = \begin{pmatrix} 3 & 2 \\ 2 & 1 \end{pmatrix}$.

Write down matrix \mathbf{A} .

Answer (a) $\begin{pmatrix} & \\ & \end{pmatrix}$ [1]

(b) $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$

Find the values of x and y .

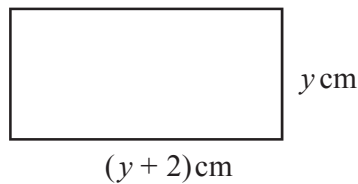
Answer (b) $x = \dots\dots\dots$ and $y = \dots\dots\dots$ [2]

(c) It is given that $\begin{pmatrix} 4 & 3 \\ -n & 5 \end{pmatrix} = \begin{pmatrix} 4 & 3 \\ n-4 & 5 \end{pmatrix}$,

Find the value of n .

Answer (c) $n = \dots\dots\dots$ [2]

(d) The figure below is a rectangle with the given sides.



(i) Form an expression in y for the perimeter of the figure.

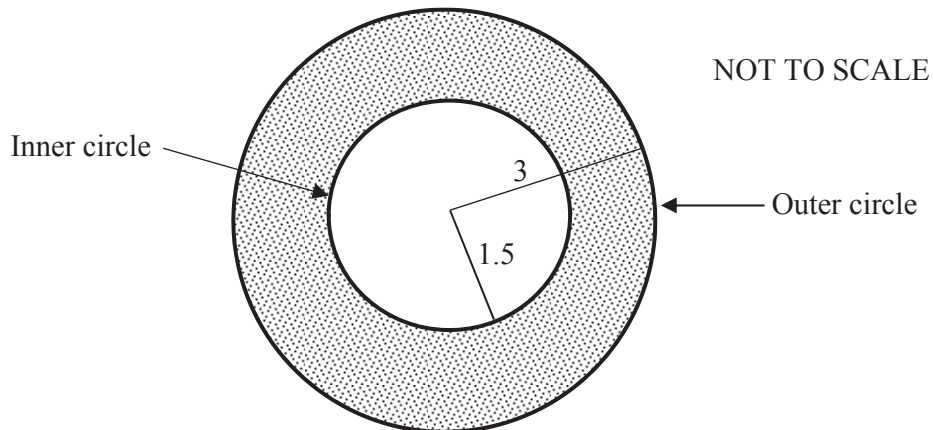
Answer (d)(i) $\dots\dots\dots$ [1]

(ii) If the perimeter of the figure is 24 cm, form and solve an equation to find y .

Answer (d)(ii) $\dots\dots\dots$ cm [2]

- 9 The diagram shows the design of part of an earring.

The cross section of the earring is circular.



The radius of the outer circle is 3 cm.
The radius of the inner circle is 1.5 cm.
The shaded part will be painted.

- (a) Calculate the circumference of the outer circle.

Answer (a) cm [2]

- (b) One side of the earring is painted as shown.

Calculate the area which will be painted.

Answer (b) cm² [3]

- 10 (a) A woman borrowed E40 000 from her Cooperative Society.

The Cooperative Society charged simple interest at 13% per annum.
She repaid the money at the end of 5 years.

- (i) How much interest did she pay after one year?

Answer (a)(i) E [2]

- (ii) How much money did she pay back at the end of the five years?

Answer (a)(ii) E [2]

- (b) James bought a water pump for E18 000 excluding tax.

He was charged 12% sales tax.

Calculate the **total** amount paid by James for the pump.

Answer (b) [3]

- (c) On a particular day, the rate of exchange between the British Pound (£) and the Eswatini Emalangeni (E) was **£1 to E17.37**.

Convert E50 000 to British Pounds at this rate.

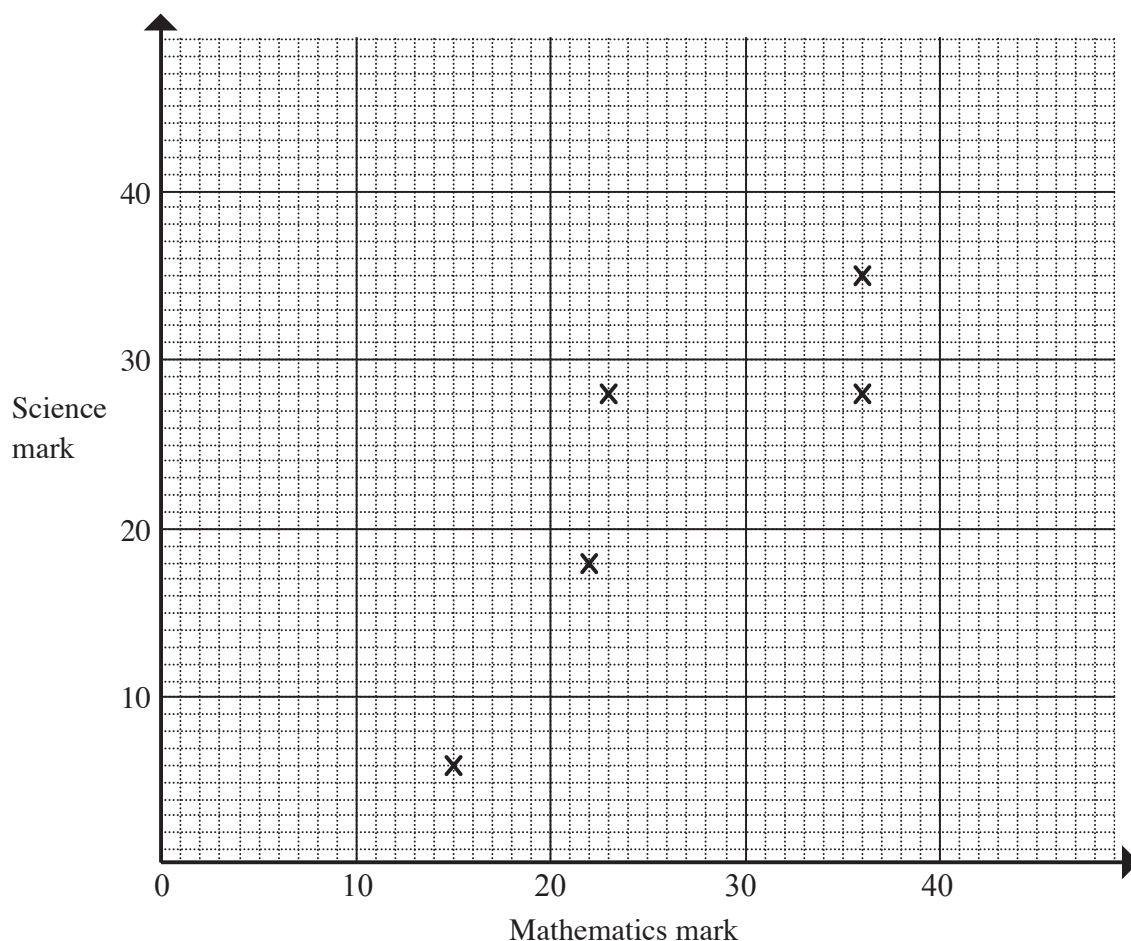
Answer (c) £ [2]

- 11** The following data shows the marks for 11 students in a Science test and a Mathematics test.

Maths	15	36	36	22	23	27	43	22	43	40	26
Science	6	28	35	18	28	28	37	9	41	45	17

- (a)** Complete the plot of this data in the following scatter diagram.

The first five points have been plotted for you.



[3]

- (b)** What type of correlation is shown on your scatter diagram?

Answer (b) [1]

- (c)** Draw the line of best fit.

[1]

- (d)** Estimate the mark for Science of a learner who got 30 in Mathematics.

Answer (d) [1]

- (e)** Calculate the range of the Science marks.

Answer (e) [1]

- 12** The angle of elevation of the top of a building is 25° from a point C on level ground.

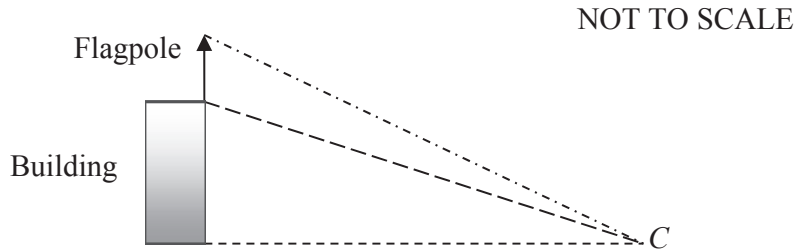
A flagpole stands at the top of the building.

The angle of depression from the top of the flagpole to the point C is 30° .

The distance from the foot of the building to point C is 50 m.

The length of the flagpole is 5.55 m.

A sketch is drawn below.



- (a)** Find the angle of elevation of the top of the flagpole from C .

Answer (a) $^\circ$ [1]

- (b)** Calculate the height of the building.

Answer (b) m [2]

- (c)** Calculate the distance from C to the top of the flagpole.

Answer (c) m [3]

- (d)** Another point D on the same level ground is 75 m from the building.

Calculate the distance of point D from the top of the building.

Answer (d) [2]

- 13 (a) You are given that $y = x^2 - 3x - 1$.

The table below is for corresponding values of x and y .

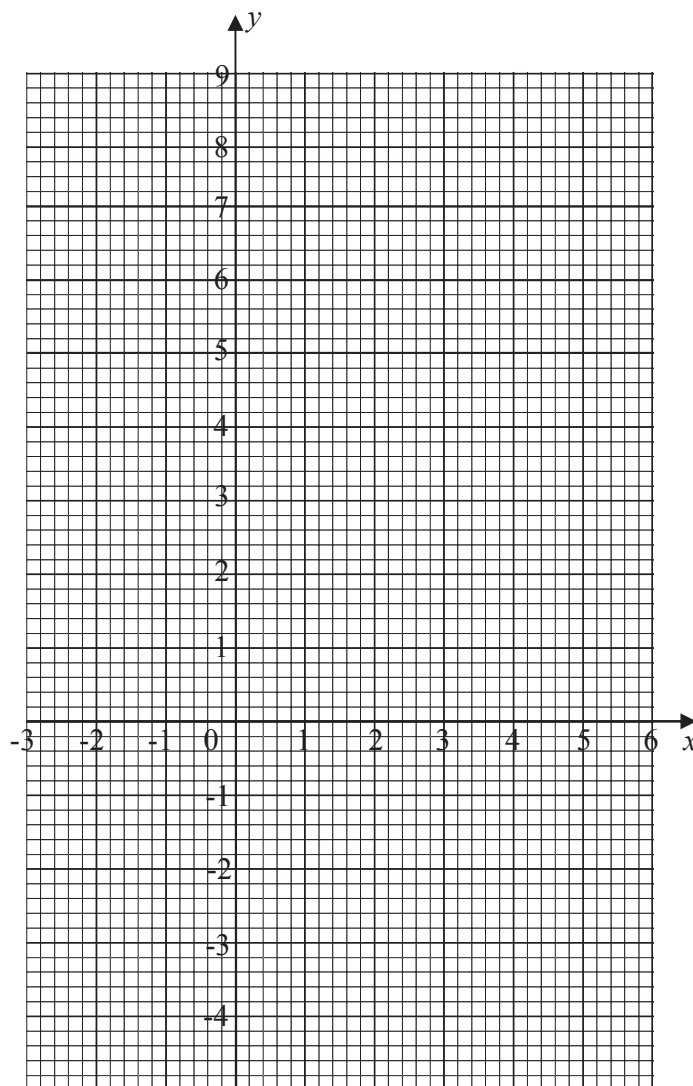
x	-2	-1	0	1	2	3	4	5
y	9	3	-1	p	-3	-1	q	9

- (i) Find the values of p and q

Answer (a)(i) $p = \dots\dots\dots$

$q = \dots\dots\dots$ [2]

- (ii) On the grid below, draw the graph of $y = x^2 - 3x - 1$



[3]

- (b) (i)** The point $(-1, m)$ lies on the line $y = 2 - x$.

Find the value of m .

Answer (b)(i) $m = \dots\dots\dots$ [1]

- (ii)** On the same grid as in part **(a)**, draw the graph of $y = 2 - x$. [2]

- (iii)** Hence, solve the equation $x^2 - 3x - 1 = 2 - x$.

Answer (b)(iii) $x = \dots\dots\dots$ or $x = \dots\dots\dots$ [2]
