EXAMINATIONS COUNCIL OF SWAZILAND
in collaboration with
CAMBRIDGE INTERNATIONAL EXAMINATIONS
Swaziland General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

3589609150

MATHEMATICS **6880/02**

Paper 2 Calculator Structured Questions (Core and Extended) **May/June 2012**

2 hours

Candidates answer on the Question Paper.

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

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on **all** the work you hand in.
Write in dark blue or black pen on the spaces provided on the Question Paper.
You may use a 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.

The total of the marks for this paper is 90.
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.

For Examiner's Use	
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Total	

This document consists of **16** printed pages.

1 **(a)** Find two prime numbers whose sum is 15.

Answer (a) .....[2]

(b) Given the universal set

$\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
$A = \{\text{prime numbers}\}$
$B = \{\text{factors of } 10\}$

(i) List the elements of set A.

Answer (b)(i) $A = \{$.....$\}$ [1]

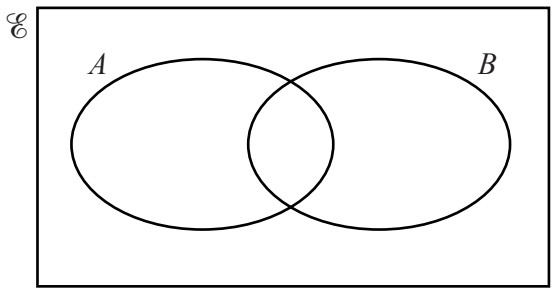
(ii) List the elements of set B.

Answer (b)(ii) $B = \{$.....$\}$ [1]

(iii) Find $n(A \cap B)'$.

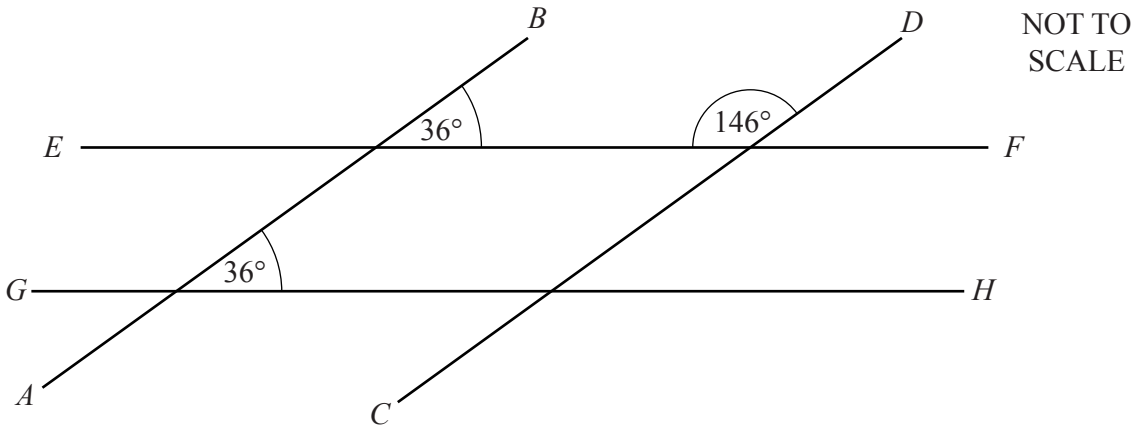
Answer (b)(iii) .....[1]

(iv) In the Venn diagram below write the elements of sets A, B and $\mathscr{E}$ in the appropriate regions.



[3]

2 The diagram shows lines *AB*, *CD*, *EF* and *GH*.



For each of these pairs of lines state whether the lines are parallel and give a reason for your answer.

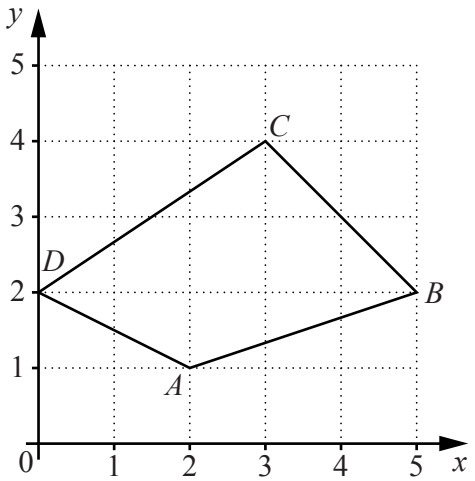
(a) *AB* and *CD*

Answer (a) .....[1]

(b) *EF* and *GH*

Answer (b) .....[1]

3 In the diagram the coordinates of the vertices of quadrilateral $ABCD$ are $A(2, 1)$, $B(5, 2)$, $C(3, 4)$, $D(0, 2)$.



(a) Express the following as column vectors.

(i) $\overrightarrow{CA}$

Answer (a)(i) ( ) [1]

(ii) $\overrightarrow{BD}$

Answer (a)(ii) ( ) [1]

(iii) $2\overrightarrow{AB} - 3\overrightarrow{BC}$

Answer (a)(iii) ( ) [2]

(b) (i) E is a point such that $\overrightarrow{AD} = \overrightarrow{BE}$.

Find the coordinates of E.

Answer (b)(i) E (..... , ...) [1]

(ii) Work out $\left|\overrightarrow{CD}\right|$.

Answer (b)(ii) .....[2]

[Turn over

4 **(a)** You are given that $f(x) = 7 - 2x$.

Find

(i) $f^{-1}(x)$,

Answer (a)(i) ..... [3]

(ii) $f^{-1}(-3)$.

Answer (a)(ii) ..... [1]

(b) Remove the brackets and simplify each of the following.

(i) $(x + 3)(x - 2)$

Answer (b)(i) ..... [2]

(ii) $3(a - b) - 4(a - 3b)$

Answer (b)(ii) ..... [3]

(c) Solve this inequality.

$$\frac{x}{4} > \frac{x}{3} + 1$$

Answer (c) ..... [3]

5 **(a)** Sibonisile and Gabi started working for the same company in 1999.
In 1999, Sibonisile earned E24 000 and Gabi earned E21 500.
Each year Sibonisile earned E1000 more than the previous year and Gabi earned E1500 more than the previous year.

(i) How much did Sibonisile earn in 2001?

Answer (a)(i) ..... [1]

(ii) In which year did they earn the same amount of money?

Answer (a)(ii) ..... [2]

(b) A car travels at an average speed of 110 km/h.

How many hours will it take to travel a distance of 385 km?

Answer (b) ..... [2]

6 **(a)** Simplify

(i) $\frac{2-x}{5} - \frac{x+3}{2}$,

Answer (a)(i) ..... [3]

(ii) $(a^2)^3 \div a^5$.

Answer (a)(ii) ..... [2]

(b) Factorise completely

(i) $8y^2 - 12y$,

Answer (b)(i) ..... [2]

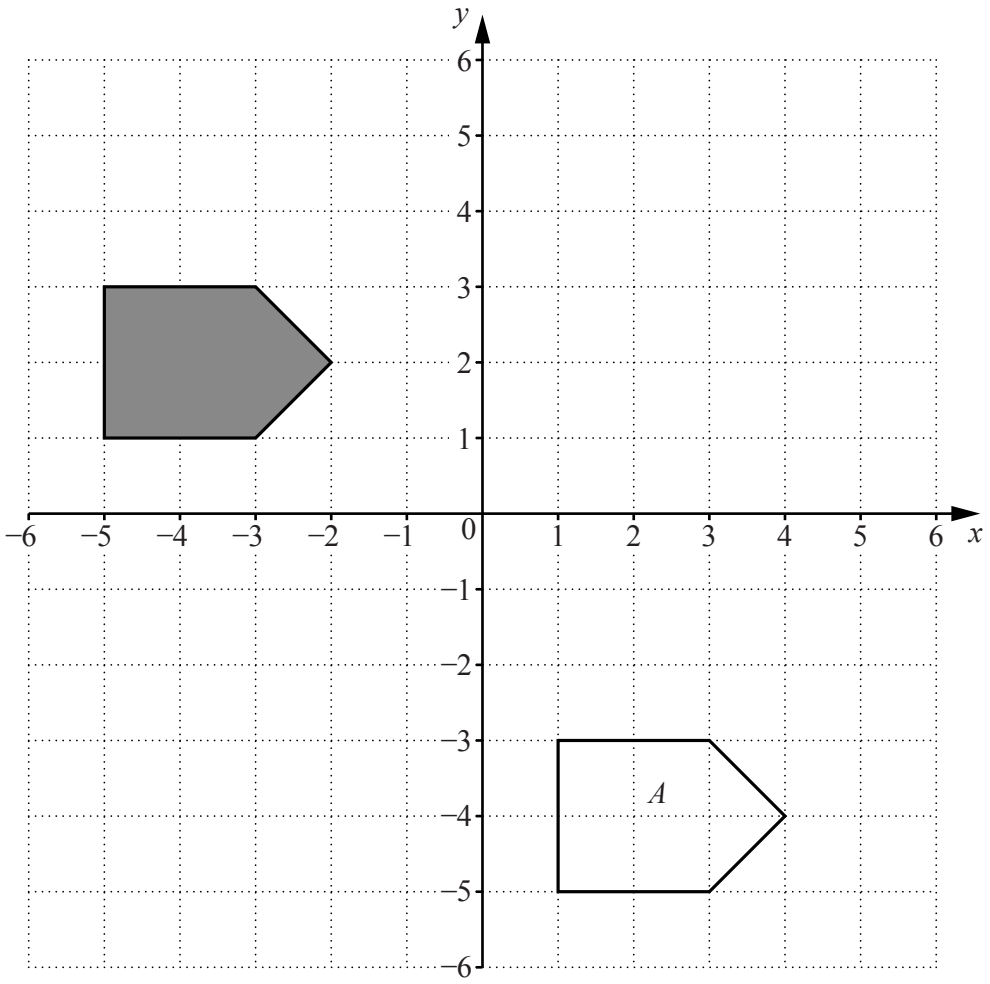
(ii) $1 - 4x^2$,

Answer (b)(ii) ..... [1]

(iii) $x^2 - 12x + 32$.

Answer (b)(iii) ..... [2]

7 The grid below shows a shaded pentagon and an unshaded pentagon *A*.



(a) Describe the **single** transformation which maps the shaded pentagon onto pentagon *A*.

Answer (a) .....

..... [2]

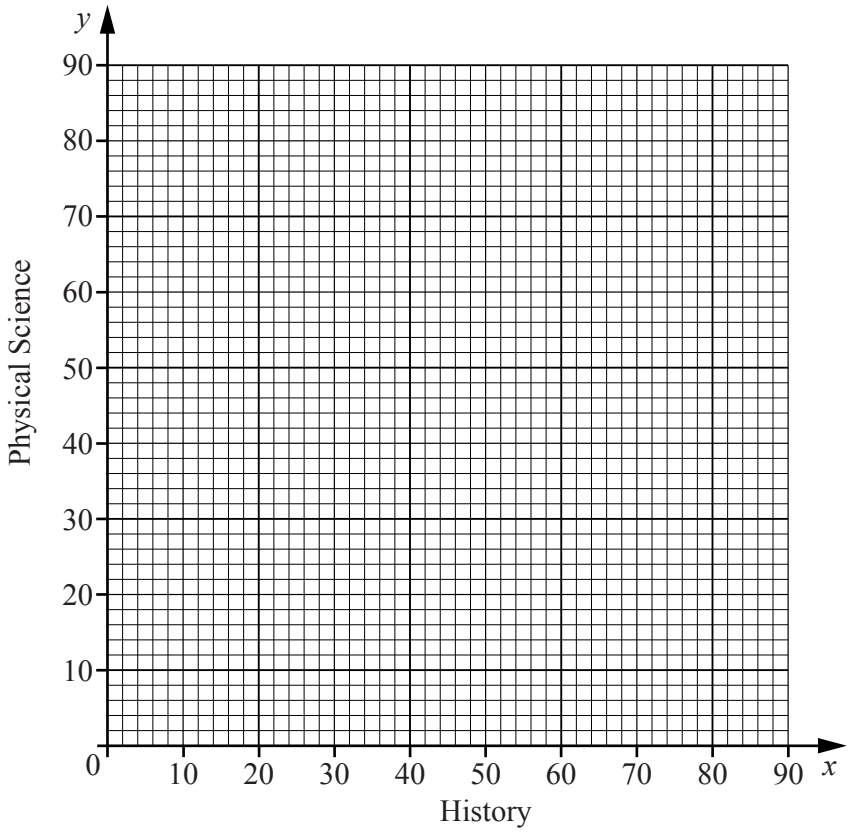
(b) **(i)** Reflect the shaded pentagon in the *y*-axis.
Label the image *B*. [1]

(ii) Rotate the shaded pentagon 90° anticlockwise about the centre (–1, 2).
Label the image *C*. [2]

8 A group of learners took a History test and a Physical Science test.
The percentage scores for the learners are shown in the table below.

History	70	52	15	15	24	10	40	37	20	40	63	60
Physical Science	9	25	60	56	52	65	40	40	60	30	18	15

(a) On the grid, plot a scatter diagram to show this information. [3]



(b) Describe the strength and type of the correlation.

Answer (b) .....

..... [2]

(c) Draw a line of best fit. [2]

(d) Estimate the History score for a learner who scores 30% in Physical Science.

Answer (d) .....[1]

(e) For History, find the

(i) mean score,

Answer (e)(i) .....[2]

(ii) median score.

Answer (e)(ii) .....[2]

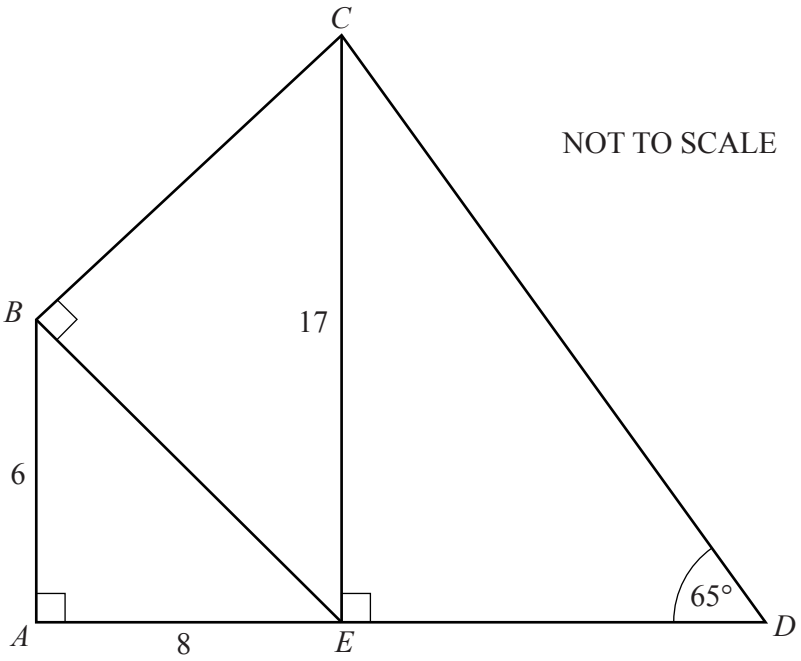
(f) Find the probability that a learner selected at random has a History score above 60%.

Answer (f) .....[1]

9 In the diagram below, AED is a straight line.

$B\hat{A}E = C\hat{B}E = C\hat{E}D = 90°$, $E\hat{D}C = 65°$.

$AB = 6\,\text{m}$, $AE = 8\,\text{m}$ and $EC = 17\,\text{m}$.



(a) Show that BE is 10 m.

Answer (a) .....

.....

.....

..... [2]

(b) Calculate the length of

(i) BC,

Answer (b)(i) BC= .....m [2]

(ii) *CD*,

Answer (b)(ii) *CD* = ...m [2]

(iii) *AD*.

Answer (b)(iii) *AD* = ...m [3]

(c) Hence, find

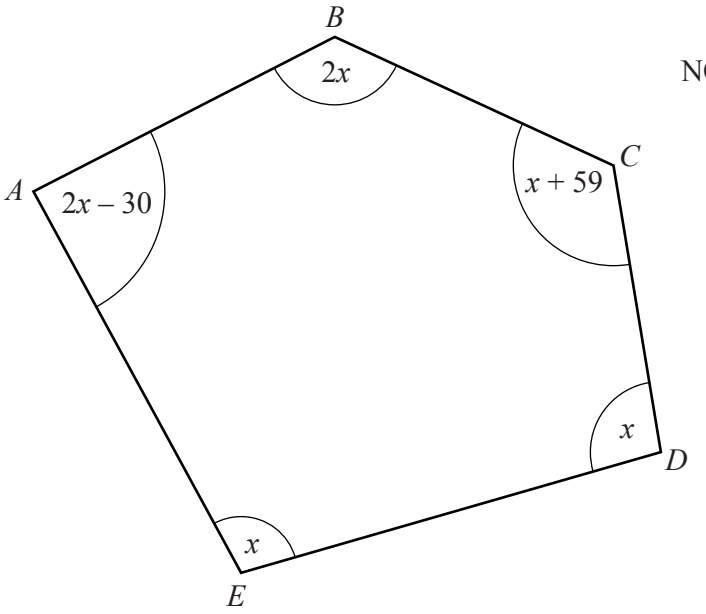
(i) the perimeter of quadrilateral *ABCD*,

Answer (c)(i) Perimeter = ...m [2]

(ii) the area of quadrilateral *ABCD*.

Answer (c)(ii) Area = ... m^2 [4]

10 Given the polygon *ABCDE*.



(a) Write down the name of polygon *ABCDE*.

Answer (a) ..... [1]

(b) Write an expression in terms of x for the sum of the interior angles of the polygon.

Answer (b) ..... [2]

(c) Using the sum of the interior angles of the polygon, form an equation and solve it to find the value of x.

Answer (c) $x =$ .....[3]

(d) Calculate the size of angle A.

Answer (d) .....[1]

11 In the diagram the lines joining the dots form a pattern of triangles.

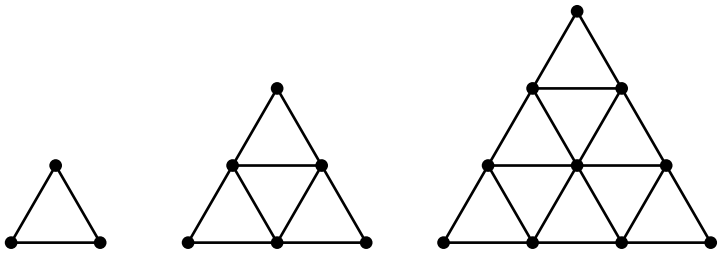


Diagram 1 Diagram 2 Diagram 3 Diagram 4

(a) Draw diagram 4. [1]

(b) The triangle in Diagram 1 is a small triangle.
The table shows the resulting pattern.

Diagram number (n)	No. of small identical triangles (t)	No. of dots	No. of lines
1	1	3	3
2	4	6	9
3	9	10	18
4	16	15	30
5	x	21	45
6	36	y	63
7	49	36	z

(i) Find the values of x, y and z.

Answer (b)(i) x = ... [1]

y = ... [1]

z = ... [1]

(ii) Express the number of triangles, t, in terms of Diagram number, n.

Answer(b)(ii) t = ... [2]