EXAMINATIONS COUNCIL OF SWAZILAND
Swaziland General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

MATHEMATICS **6880/02**

Paper 2 Calculator Structured Questions (Core and Extended) **October/November 2013**

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 all the work you hand in.
Write in dark blue or black pen in 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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This document consists of **14** printed pages and **2** blank pages.

1 **(a)** Round off 64 967

(i) to the nearest hundred,

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

(ii) to the nearest ten.

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

(b) Convert 398.595 m

(i) to centimetres,

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

(ii) to kilometres.

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

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2 Describe, using a mathematical term, each of the following.

(a) Lines that never meet.

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

(b) An angle more than 180°.

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

(c) A 4-sided polygon.

Answer (c) .....[1]

(d) Lines that meet at 90°.

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

(e) Identical shapes.

Answer (e) .....[1]

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3 **(a)** Work out

(i) 28% of 3 tonnes,

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

(ii) 130% of 3 cm.

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

(b) Mr Mhlanga earns E2000.
He pays E600 for rent.

(i) What percentage of his salary does he pay for rent?

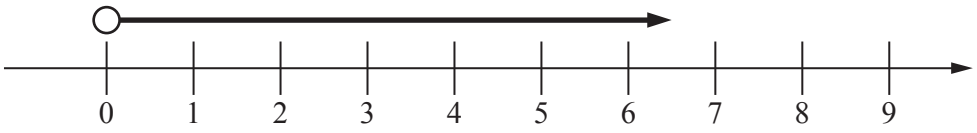
Answer (b)(i).....% [2]

(ii) His rent is increased by 12%.

Calculate his new rent.

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

4 The number line below represents an inequality.



(a) From the inequality, list

(i) the three smallest integers,

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

(ii) the three smallest prime numbers,

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

(iii) the three smallest cube numbers of the set.

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

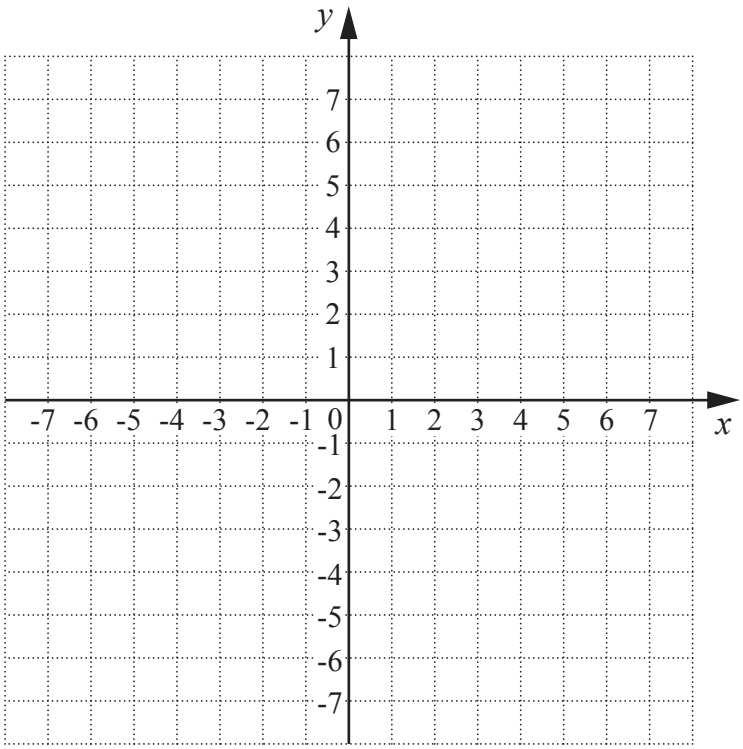
(b) In another set, x is an integer such that
$\{x : 1 < x \leqslant 5\}$

List all the values of x.

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

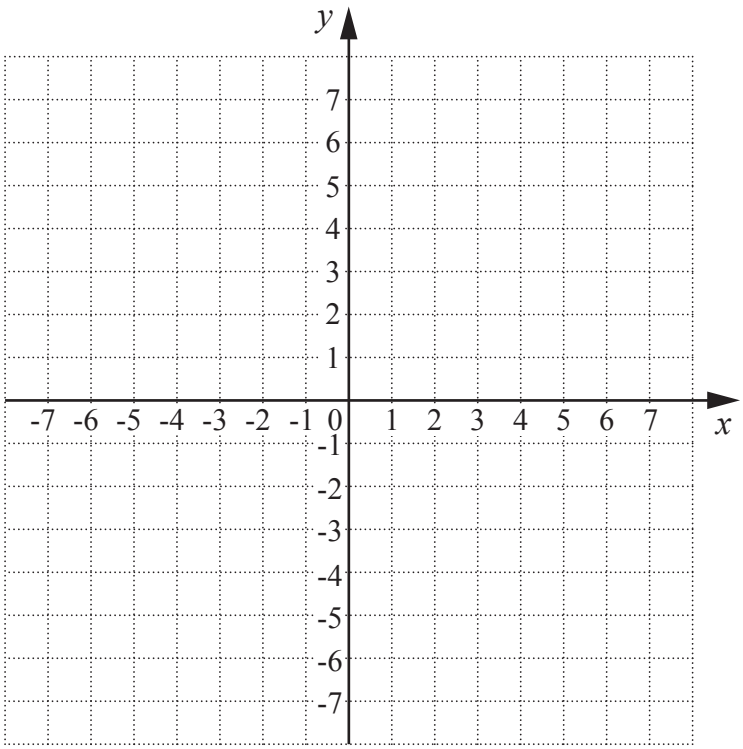
(c) Using shading, show each of the following regions on the given grid.

(i) $y \leqslant 5$



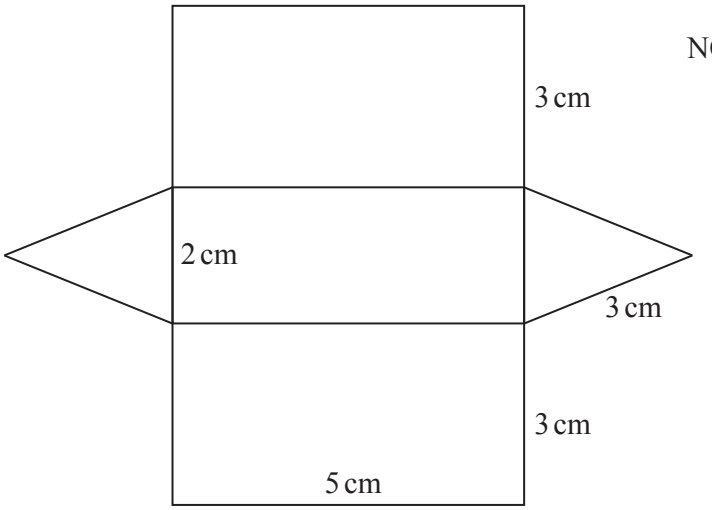
[2]

(ii) $y > x + 2$



[3]

5 The diagram shows the net of a solid.



(a) Write down the name of the solid.

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

(b) The area of each triangular face is 2.83 cm^2

(i) Calculate the total surface area of the solid.

Answer (b)(i).....cm^2 [3]

(ii) Work out the volume of the solid.

Answer (b)(ii).....cm^3 [2]

6 Tiny, Vuyi and Zandi went to a shop to buy sweets.
Tiny bought 3 smoothies and 4 toffees.
Vuyi bought 2 smoothies and 5 toffees.
Zandi bought 4 smoothies and 2 toffees.

(a) The matrix below shows the information above.
Write down the values of p and q.

$$\begin{pmatrix} 3 & 4 \\ 2 & p \\ q & 2 \end{pmatrix}$$

Answer (a) $p =$ .....

$q =$ .....
[2]

(b) Smoothies cost 15 cents each and toffees cost 20 cents each.

This information is shown in the matrix $\begin{pmatrix} 15 \\ 20 \end{pmatrix}$.

For the equation below

$$\begin{pmatrix} 3 & 4 \\ 2 & p \\ q & 2 \end{pmatrix} \begin{pmatrix} 15 \\ 20 \end{pmatrix} = \begin{pmatrix} a \\ b \\ c \end{pmatrix}$$

(i) **explain** what a represents,

Answer (b)(i) .....

..... [2]

(ii) find the values of a, b, and c.

Answer (b)(ii) $a =$ .....

$b =$ .....

$c =$ .....
[3]

(c) How much money, in **Emalangeni**, did the three girls spend altogether?

Answer (c) E ..... [2]

7 **(a)** Given the equation $y = 3 - 5x$, state

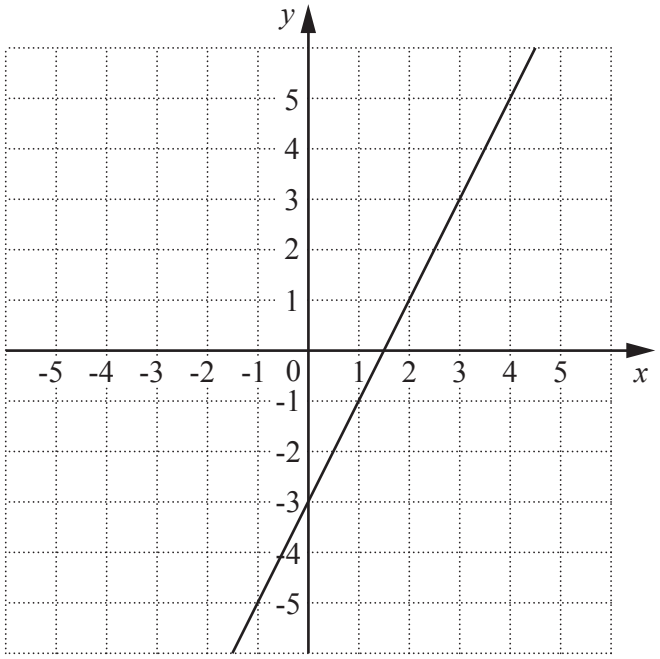
(i) the y-intercept,

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

(ii) the gradient of the line.

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

(b) The graph of $y = mx + c$ is drawn on the grid.



(i) Complete the table for $y = 3 - x$.

x	–1	0	3
$y = 3 - x$		3	0

[1]

(ii) Using the table in part **(b)(i)**, draw the graph of $y = 3 - x$. [2]

(c) Hence solve these two equations simultaneously.

$y = mx + c$

$y = 3 - x$

Answer (c) x = ... y = ...[2]

8 **(a)** A regular polygon has 8 sides.

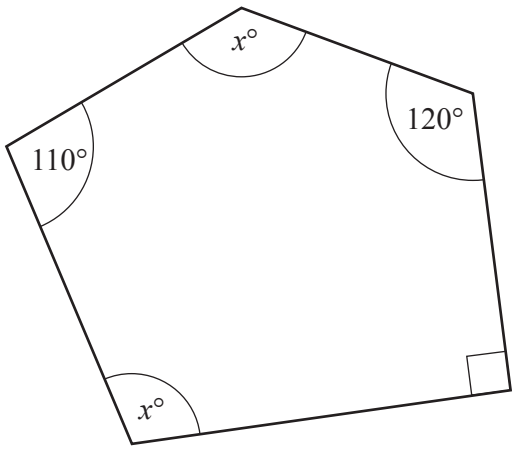
(i) Give the name of the polygon.

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

(ii) Calculate the size of each **exterior** angle of the polygon.

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

(b) The diagram shows a pentagon.



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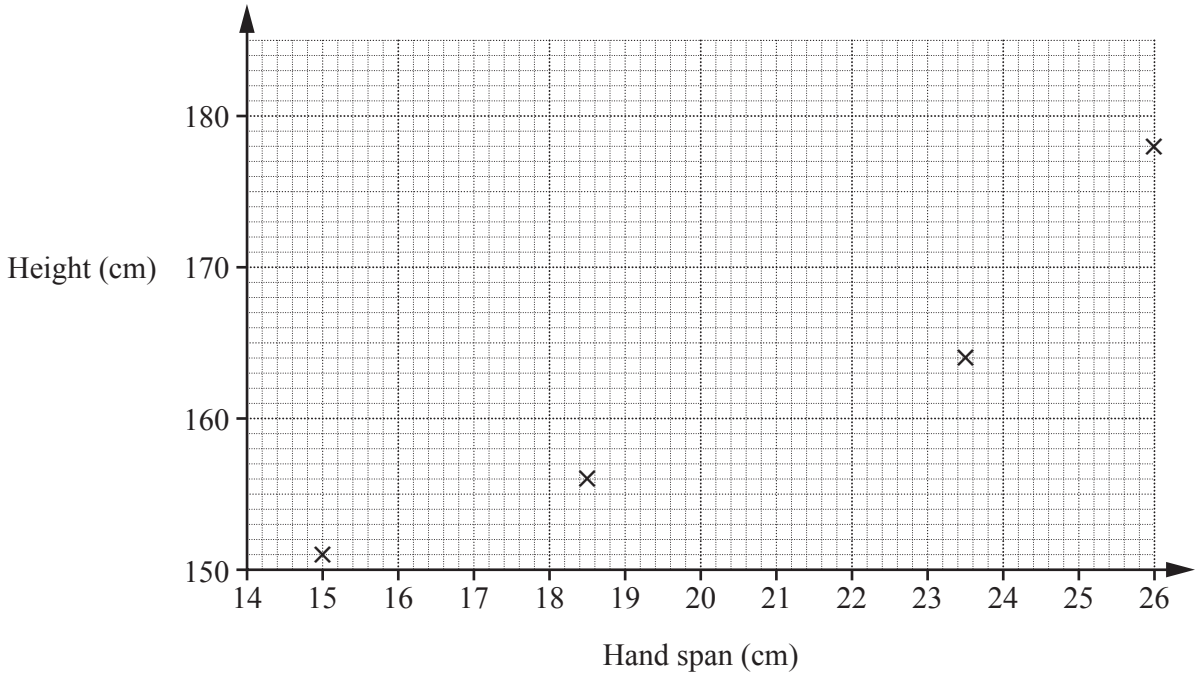
Calculate the value of x.

Answer (b) x = ...[3]

9 Mr Mshengu selected 10 students from his school and measured their hand spans and their heights.
The results are shown in the table.

Hand span (cm)	15	18.5	23.5	26	19	23	17.5	25	20.5	22
Height (cm)	151	156	164	178	162	170	154	168	168	160

(a) Complete the scatter diagram.
The first four points have been plotted for you. [2]



(b) Draw the line of best fit. [1]

(c) Use the line to estimate the height of a student with a hand span of 21 cm.

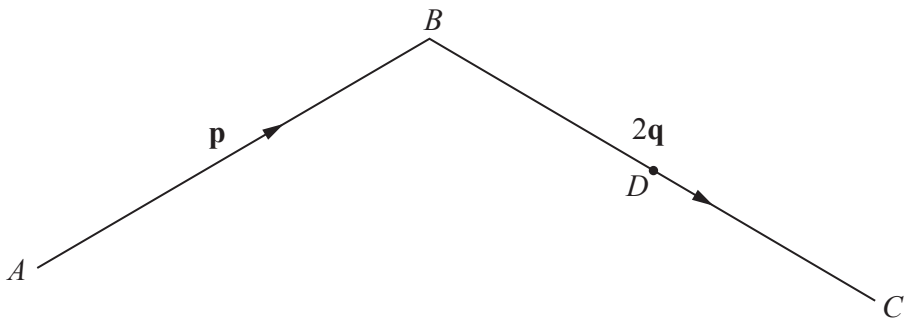
Answer (c) ..... cm [1]

(d) Describe the type of correlation.

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

10 **(a)** Given that $\overrightarrow{AB} = \mathbf{p}$, $\overrightarrow{BC} = 2\mathbf{q}$ and that D is the mid-point of BC as shown on the diagram.

Express the following vectors in terms of **p** and/or **q**.



(i) $\overrightarrow{AC}$

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

(ii) $\overrightarrow{CD}$

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

(iii) $\overrightarrow{DA}$

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

(b) Given that $\overrightarrow{KL} = \begin{pmatrix} -7 \\ 3 \end{pmatrix}$ and $\overrightarrow{LM} = \begin{pmatrix} 1 \\ 2 \end{pmatrix}$, find

(i) $\overrightarrow{KM}$,

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

(ii) the length of KL.

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

[Turn over

11 **(a)** The number of beans in each of 90 bean pods were counted.
The results are shown in the table.

Number of beans	Number of pods
3	0
4	5
5	15
6	27
7	30
8	13
9	0

Find

(i) the mode,

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

(ii) the median.

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

(b) The lengths, l mm, of 36 of these pods in part **(a)** were measured, to the nearest millimetre.
The results are shown below.

52	80	65	82	77	60	72	83	63
78	84	75	53	73	70	86	55	88
85	59	76	86	73	89	91	76	92
66	93	84	62	79	90	73	68	71

(i) Copy and complete the frequency table.

Length (cm)	Tally marks	Number of pods
$50 \leqslant l < 60$		4
$60 \leqslant l < 70$		
$70 \leqslant l < 80$		
$80 \leqslant l < 90$		
$90 \leqslant l < 100$		

[3]

(ii) How many pods measured less than 70 mm?

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

(iii) How many pods measured at least 90 mm?

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

(iv) A pod is chosen at random.
Calculate the probably that the pod measures at least 80 mm.

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

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12 You are given $f : x \mapsto 3x - 2$.

(a) If the domain is the set $\{-2, -1, 0, 1\}$, find the range of the function.

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

(b) Find $f^{-1}(x)$.

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

(c) Find the value of $f^{-1}(7)$.

Answer (c) .....[2]

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13 **(a)** You are given that $v = u + at$.

(i) Work out the value of v when $u = -50$, $a = 10$ and $t = 3$.

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

(ii) Make t the subject of the formula.

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

(b) Andile is x years old.
His brother, Bongani, is 4 years older than him.
Their eldest brother, Colani, is 3 times as old as Andile.

Express, in terms of x,

(i) Bongani's age,

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

(ii) Colani's age.

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

(iii) The sum of the ages of the three children is 24 years.

Form an equation, in terms of x, and solve it to find Andile's age.

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

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