EXAMINATIONS COUNCIL OF SWAZILAND
JUNIOR CERTIFICATE EXAMINATION

CANDIDATE NAME	

CANDIDATE NUMBER	

MATHEMATICS **309/01**
Paper 1 **October/November 2012**
2 hours 30 minutes

Candidates answer on the question paper

READ THESE INSTRUCTIONS FIRST

1. Write your name and candidate number on the space provided at the top of this page.
2. This paper is in two sections:

   SECTION A: (52 MARKS): All answers in this section must be written in the answer spaces provided.

   SECTION B: (48 MARKS): All answers in this section must be shown on the GRID provided. Read the instructions on how to use the ANSWER GRID at the beginning of SECTION B.

   Answer **all** questions in this paper.
3. All necessary working must be done in the spaces below each question.
   SCRAP PAPER IS NOT ALLOWED. FAILURE TO SHOW NECESSARY WORKING WILL RESULT IN LOSS OF MARKS.
4. Graph paper and tracing paper will be provided when needed.
5. Calculators and tables are **not** allowed in this paper.
6. At the end of the examination, hand in the question paper, the Answer Grid and any other paper used. Do not remove any pages from the question paper.
7. **FAILURE TO FOLLOW THE ABOVE INSTRUCTIONS WILL RESULT IN LOSS OF MARKS.**
8. The total of the marks for this paper is 100.

This question paper consists of **14** printed pages and **2** blank pages.

SECTION A

ANSWER ALL QUESTIONS

1. Round off 0.037429 to:

(a) to the nearest whole number.

_____[1]

(b) 3 decimal places.

_____[1]

(c) 3 significant figures.

_____[1]

2 Work out :

(a) $13 - \frac{3}{7}$

_____[1]

(b) $\frac{2}{5} \div \frac{1}{4}$

_____[2]

(c) $2\frac{2}{3} \times 2\frac{1}{2}$

_____[2]

3 **(a)** Write down factors of 18.

_____[2]

(b) Write 90 as a product of its prime factors.

_____[2]

(**c)** What is the lowest common multiple of 8 and 12.

_____[1]

4 Mr. Bulunga bought 4 hectares of land. He used 2.2 hectares to grow potatoes.

(a) Express 2.2 hectares in m^2.

_____[1]

(b) Express the area used to grow potatoes as a percentage of Mr Bulunga's land.

_____[2]

5 $\mathscr{E} = \{ \pi,\ -1,\ 0,\ 2,\ \sqrt{3},\ 6.3,\ \frac{13}{8},\ -3\frac{1}{2} \}$

P = {integers}

Q = {irrational numbers}

R = {rational numbers}

List members of:

(a) Q

_____[1]

(b) P ∩ R

_____(2]

6 **(a)** What is the order of rotational symmetry for a regular octagon about its centre?

_____[1]

(b) What is the smallest angle of the rotational symmetry of a regular octagon?

_____[2]

7 A translation maps F(15, 3) onto G (25, 7).

Find the vector for the translation which maps F onto G.

$\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [2]

8 A piece of wire is bent into a circle with diameter 10 cm. Taking π as 3.14, calculate:

(a) the length of the wire.

_____[2]

(b) the area enclosed by the wire.

_____[2]

9 Simplify: $5-3(m+2n-1)$

_____[2]

10 Solve : $\frac{1}{2}(x-5) \leq 3x$

_____[3]

11 Simplify:

(a) $2y \times y^2 \times y^3 \times 3y^6 z$

_____[2]

(b) $\frac{a^4 b^3}{ab^2}$

_____[2]

12 An airplane leaves Matsapha and reaches Johannesburg at 1410hrs , after 45 minutes flying time.

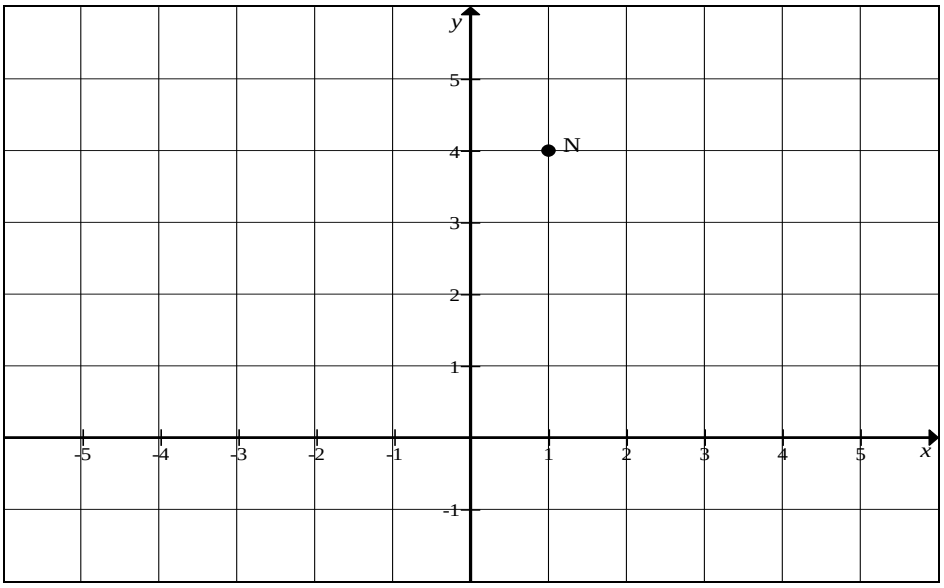
(a) At what time did the plane leave Matsapha ?

_____[1]

(b) If the speed of the plane was 360 km/hr, what is the air distance in km, from Matsapha to Johannesburg?

_____[2]

13 N is a point (1, 4).



Write down the coordinates of the image of N:

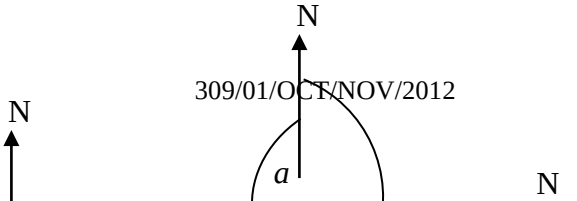
(a) after a reflection in the line $y = x$

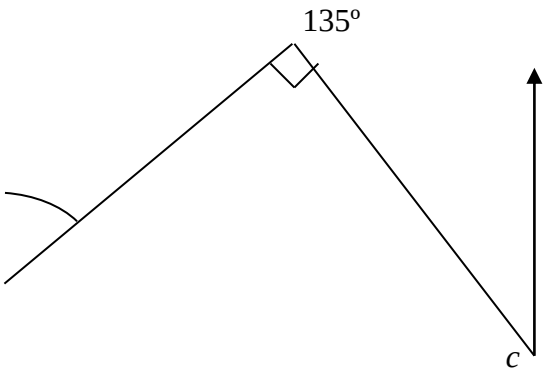
_____[1]

(b) after a rotation through $^{+}90°$ about the point (1,0)

_____[2]

14 Calculate the angles marked *a*, *b* and *c*.





a =_____[2]

b =_____[1]

c =_____[2]

15 Six girls wear dresses of sizes 34, 32, 36, 32, 38, and 32.

(a) Calculate the mean dress size.

_____[2]

(b) A seventh girl joins the group. The mean dress size of the seven girls is 36. What dress size does the seventh girl were?

_____[2]

SECTION B (50 marks)
ANSWER ALL QUESTIONS

For each question FOUR possible answers are provided. By working out choose the correct answer and indicate this by a **cross** at the corresponding letter on the answer grid provided.

Example:

100. What is : 15 + 2

A 22 B 17 C 13 D 7

	A	B	C	D
100				

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16 Arrange the following fractions in order of size starting with the largest first.

$\frac{1}{2}, \frac{5}{8}, \frac{9}{16}, \frac{3}{4}, \frac{3}{8}$

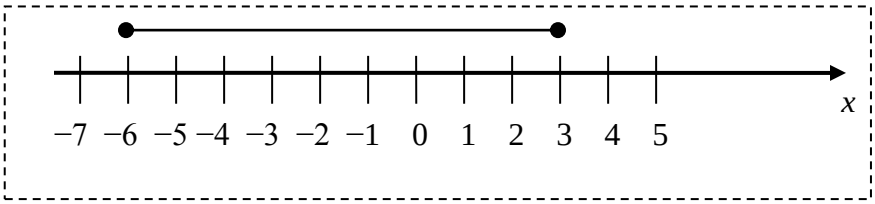
A $\frac{1}{2}, \frac{3}{4}, \frac{3}{8}, \frac{5}{8}, \frac{9}{16}$ **B** $\frac{3}{4}, \frac{5}{8}, \frac{9}{16}, \frac{1}{2}, \frac{3}{8}$

C $\frac{3}{8}, \frac{5}{8}, \frac{3}{4}, \frac{1}{2}, \frac{9}{16}$ **D** $\frac{3}{8}, \frac{1}{2}, \frac{9}{16}, \frac{5}{8}, \frac{3}{4}$

17 The distance between two airports on a map is 6cm. The actual distance between the airports is 30km.The scale of the map is :

A 1 : 500 000 **B** 1 : 5 000 **C** 1 : 500 **D** 6 : 30

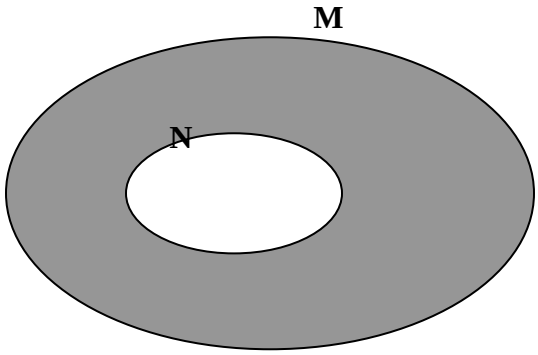
18 The inequality represented on the number line is:



A $-6 < x < 3$ **B** $-6 < x \leq 3$ **C** $-6 \leq x < 3$ **D** $-6 \leq x \leq 3$

19 In the diagram the shaded set is:

A N ∩ M **B** M′ ∩ N **C** N′ ∪ M **D** N′ ∩ M



20 A man earns E 3 600 a month. He spends E900 on food. What sector angle in degrees on a pie chart would represent his expenditure on food.

A 25° **B** 40° **C** 90° **D** 100°

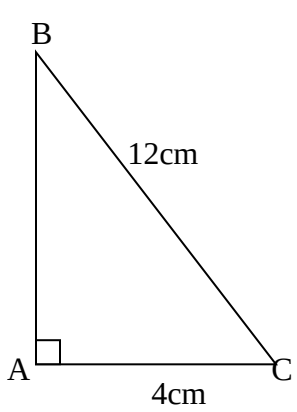
21 The estimate of $\frac{2.11 \times 3.21}{0.231}$ to one significant figure is:

A 30 **B** 29 **C** 3 **D** 2.9

22 The expression $\frac{3m^3n}{n^5} \div \frac{m^2pq}{6n^6}$ writen in its simplest form is:

A $\frac{m^5pq}{2n^5}$ **B** $\frac{2n^{10}}{m^5pq}$ **C** $\frac{pq}{18mn^2}$ **D** $\frac{18mn^2}{pq}$

23 The size of line AB in the diagram below is:



NOT TO SCALE

A 128 **B** 16 **C** $\sqrt{128}$ **D** 8

24 Factorise fully: $9m^3 + 6m^2 - 3m$

A $3m(3m^2 + 2m - m)$ **B** $3m(3m^2 + 2m - 1)$

C $m(9m^2 + 6m - 3)$ **D** $3m(3m^3 + 6m^2 - 3m)$

25 The probability of a month ending on the 30th in a year is :

A $\frac{1}{12}$ **B** $\frac{1}{4}$ **C** $\frac{4}{12}$ **D** $\frac{6}{12}$

26 Given that $\frac{3p}{2} = p - 3$ then p is:

A -6 **B** -3 **C** 3 **D** 6

27 $-1 + 24 \div 6 =$

A -5 **B** $-2\frac{1}{2}$ **C** $2\frac{3}{6}$ **D** 3

28 In an enlargement when the scale factor is less than 0, the image of a figure is:

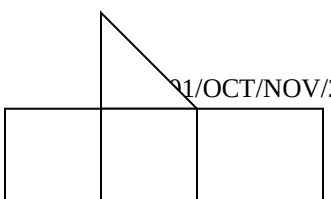
A turned over to face figure **B** turned upside down

C larger than the figure **D** same size as the figure

29 In the following distribution find the median.

16, 13, 15, 20, 12, 8, 5

A 20 **B** 15 **C** 13 **D** 12



30

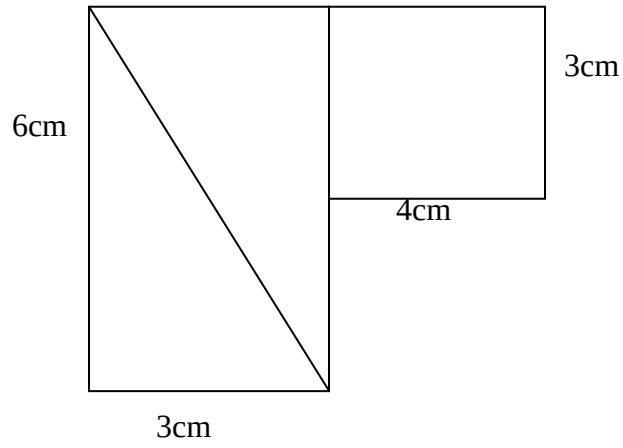
The drawing above shows the net of a:

A Pentagonal pyramid **B** Triangular pyramid

C Triangular prism **D** rectangular prism

31 The perimeter of the figure below is :

NOT TO SCALE



A 29cm **B** 26cm **C** 25cm **D** 23cm

	A	B	C	D
16				
17				
18				
19				
20				
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22				
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24				
25				
26				
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28				
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31				