EXAMINATIONS COUNCIL OF SWAZILAND
Junior Certificate Examination

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

MATHEMATICS   **309/01**

Paper 1   **October/November 2018**

                                                                                  2 hours

Candidates answer on the Question Paper.

Additional Materials: Graph paper (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 an HB pencil for any diagrams and graphs.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Calculators and tables are **not** allowed in this paper.

Answer **all** questions.
This paper is in two sections:
SECTION A: [52 Marks]: Write all answers in the answer spaces provided.
SECTION B: [48 Marks]: Show your answers on the Answer Grid provided.
Read the instructions on how to use the Answer Grid.

If working is needed for any question it must be shown below that question.
At the end of the examination, hand in the Question Paper and any other paper used. Do not remove any pages from the question paper.
The number of marks is given in brackets [ ] at the end of each question.

The total marks for this paper is 100.

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

SECTION A

1   You are given that A = { factors of 48 }

From set A, list

(a)   prime factors,

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

(b)   cube numbers.

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

---

2   Write $\dfrac{185}{9}$ as a decimal, correct to 3 significant figures.

Answer…………............………………….……………..[2]

---

3   Simplify the following expression.

$$\frac{m}{3} \quad - \quad \frac{1-m}{5}$$

Answer……. …………...............……………....………...[3]

---

4   A hotel has 56 guests.

Of these, 35 are males.

(a)   Calculate the percentage of female guests.

Answer(a)..………...........….. % [2]

(b) The percentage of male quest who are left-handed is 40%.

Work out the number of male guests that are left-handed.

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

---

5 Solve the inequality.

$$\frac{a}{3} - 2 > \frac{a}{2}$$

Answer……………..……......................…………..[3]

---

6 Two identical triangles *DEF* and *D'E'F'* are drawn on a rectangular piece of tracing paper as shown below.

NOT TO SCALE
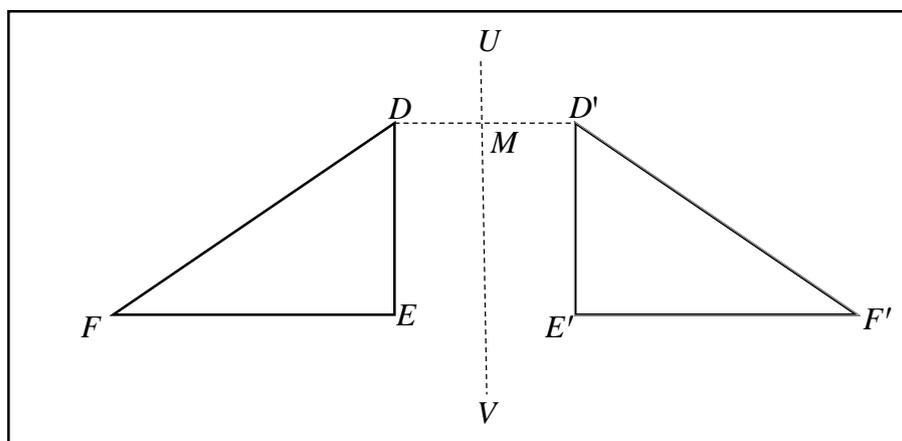
Folding the tracing paper along the line *UV* maps *D* onto *D'*, *E* onto *E'* and *F* onto *F'*.

The line *UV* meets the line *DD'* at *M*, the midpoint of *DD'*.

(a) Describe the relationship between lines *UV* and DD'.

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

(b) Describe fully, the **single** transformation that maps *DEF* onto *D'E'F'*.

Answer(b)....……………………........……………………………………….

…………………………………………………………………………[2]

---

7 A car travelling at an average speed of 60 km/h takes 1hour 45 minutes to travel from town *A* to town *B*.

Calculate the distance from town *A* to town *B*.

Answer………………..............….…… km [2]

---

8 **(a)** Evaluate.

$$(3^2)^3$$

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

(b) Work out.

$$\begin{pmatrix} 2 & -3 \\ 0 & 5 \end{pmatrix} + 2\begin{pmatrix} 1 & 2 \\ 4 & -2 \end{pmatrix}$$

Answer(b) $\begin{pmatrix} & \\ & \end{pmatrix}$ [2]

---

9 The cost of electricity is given by the formula $C = 50 + 3n$, where C is the cost in Emalangeni and *n* is the number of units used.

(a) Calculate the number of units used if the cost is E320.

Answer(a).…………………...……..………….....[2]

(b) Another cost of electricity is given by the formula $C = 5n$.

Find how many units could be bought for the two formulae to give the same cost.

Answer(b).……………..……………………….[3]

---

10 It is given that $R(2, -6)$ and $S(6, -3)$.

Calculate $\overrightarrow{RS}$

Answer $\overrightarrow{RS}$ = …............…………...………….[2]

---

11 Each letter of the phrase '*A FAIR DRAW*' is written on 9 separate identical cards.

| A | | F | A | I | R | | D | R | A | W | |

The cards are arranged with 3 identical blank cards as shown above.

The 12 cards are shuffled and one card is chosen at random.

(a) Find the probability that the chosen card is

    (i) blank,

    (ii) written letter *R*,

    (iii)   written letter *A* or *F*.

*Answers(a)***(i)**…………………………....…………………[1]

(ii)...[1]

(iii)...[1]

(b)   Describe the probability that the card chosen has letter *K* on it.

Answer (b)...[1]

---

12   Below are five numbers in standard form.

2.5×10^5 1.75×10^6 5.84×10^0 8.3×10^{-3} 4.6×10^{-1}

(a)   Write down the smallest number.

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

(b)   Write 4.6×10^{-1} as an ordinary number.

Answer(b)...[1]

(c)   Work out $2.5 \times 10^5 + 1.75 \times 10^6$.

Answer(c)...[2]

---

13   A rectangle has a width of 2 cm and a length of $(x + 3)$ cm.

    (a)   Write down and simplify an expression for the perimeter.

Answer(a)..……………........…………………[2]

(b) The perimeter of the rectangle is 20 cm.

Form an equation in *x* and solve it to find the length of the rectangle.

*Answer(b)*length = …..………..........…………..…….....….cm [3]

14 *EFGHIJKL* is a regular polygon, with centre *O*.
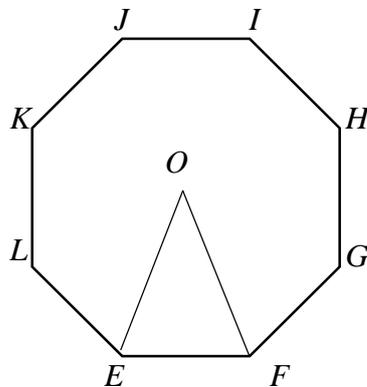
NOT TO SCALE

(a) Name the polygon.

Answer(a)..[1]

(b) Write down the special name given to triangle *EOF*.

Answer(b)..[1]

(c) Write down the order of rotational symmetry of the polygon.

Answer*(c)*..[1]

(d) Calculate $E\hat{O}F$.

Answer(d)…..[2]

---

15 In the diagram, *BC* = 20 cm and *AC* = 15 cm.
AD is perpendicular to *BC*.
The area of the triangle *ABC* is 120 cm².

NOT TO SCALE
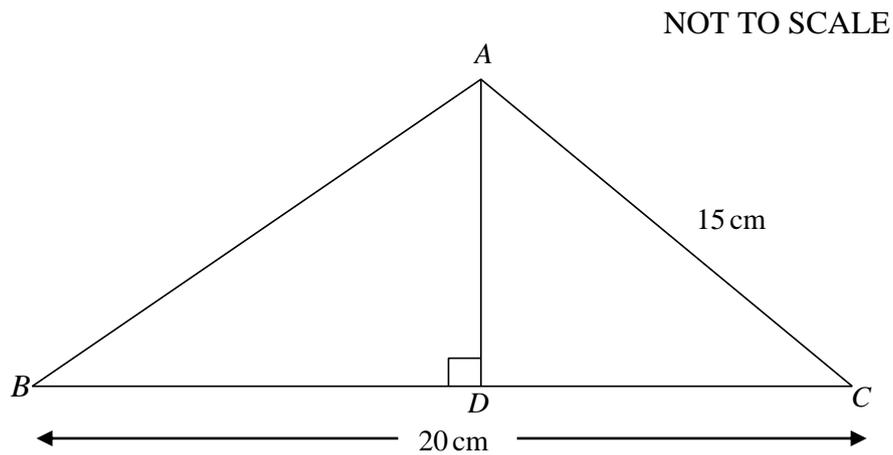
Calculate

(a) *AD*,

Answer(a)AD =...................................cm [2]

(b) *DC*.

Answer(b)DC =..................................cm [2]

(c) Write, as a fraction, tan $A\hat{B}D$.

Answer(c)tan $A\hat{B}D$ =........................... .[1]

_____

SECTION B

For each question, four possible answers are given.

Work out which one is correct and mark it on the answer grid provided.

Example

60   The LCM of 4 and 8 is

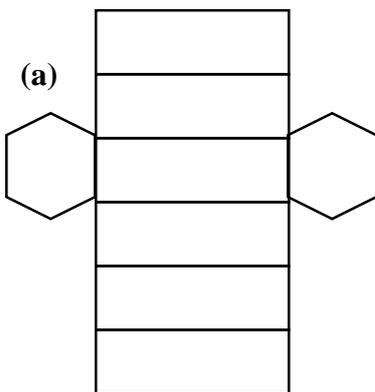   **A** 32   **B** 8   **C** 4   **D** 2

	A	**B**	**C**	**D**
60		✕		

---

16   Given that $p = 4$ and $q = {}^-6$, find the value of $3p - q$

   A – 18   **B** $^-$6   **C** 6   **D** 18

17   The diagrams below shows nets of solids.

   The nets that could form prisms are   NOT TO SCALE

(a)   **(b)**   **(c)**
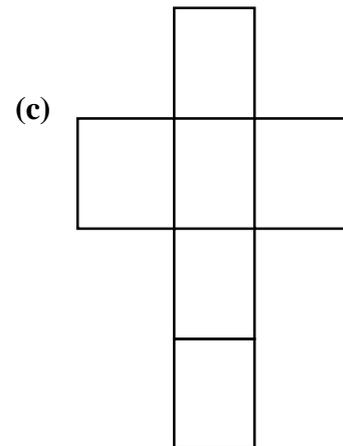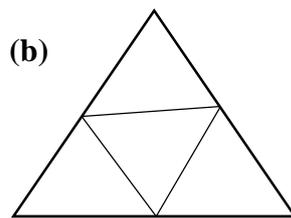
   A (a) and **(b)**   **B (a)** and **(c)**   **C (b)** and **(c)**   **D (b)** only

18 The ratio 45 minutes to 3 hours, simplifies to

    A 1: 4   **B** 4:1   **C** 15: 1   **D** 45:180

19 The area of the trapezium below is

NOT TO SCALE
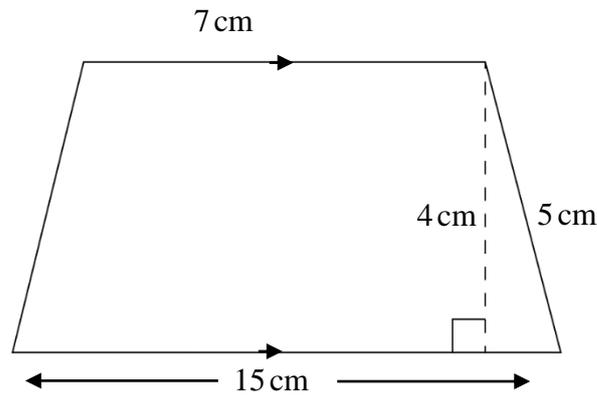
    A 108   **B** 88   **C** 55   **D** 44

20 The number 526 rounded to the nearest 30 is

    A 510   **B** 530   **C** 540   **D** 556

21 The length of a minor arc of a circle with radius 4 cm and sector angle 45° is equal to

    A 25.12   **B** 12.56   **C** 6.28   **D** 3.14

22 The expression $12y - (5 + y) - 6x$ simplifies to

    A $60y - 12y^2 - 6x$

    B $13y - 6x - 5$

    C $11y - 5 - 6x$

    D $12y - 30x - 6xy$

23 The diagram shows two parallel lines and a straight cutting.

The value of *t* is
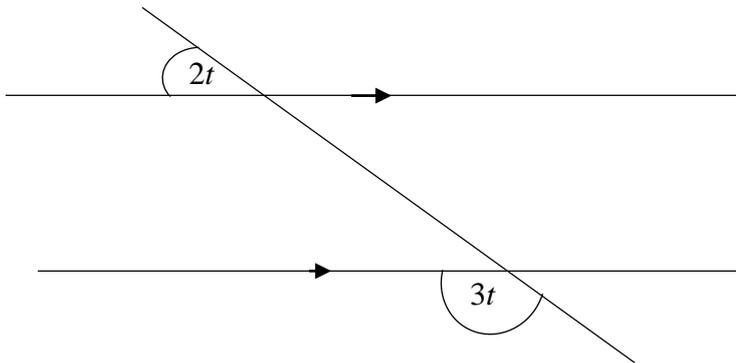
    A 18   **B** 36   **C** 108   **D** 144

24 A solid cuboid with dimensions, $5\,cm \times 3\,cm \times 2\,cm$ is made of metal with a
The mass of the cuboid is

    A 195 g   **B** 30 g   **C** 19.5 g   **D** 4.62 g

25 The locus of a point equidistant from two fixed points, *C* and *D* which are 6 cm apart is

    A An angle bisector

    B A perpendicular bisector of *CD*

    C A circle, centre C and radius 6 cm

    D A pair of straight parallel lines to *CD*, 6 cm long, on either side

26 A rectangle has a length of 5.2 cm and a width of 3.4 cm, both correct to 2 significant figures.

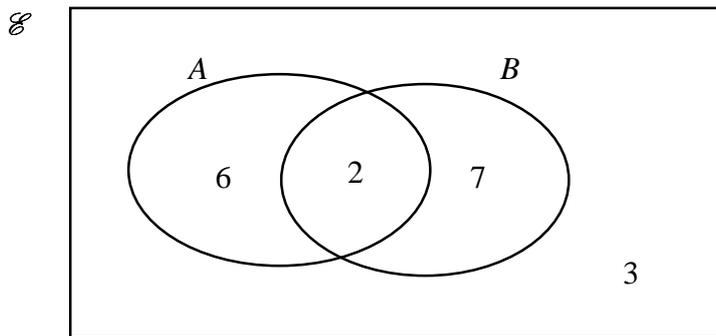The least possible value of the perimeter of the rectangle is

A 17.4 cm   **B** 17.2 cm   **C** 17.15 cm   **D** 17.0 cm

27 A translation maps the point (–2, 3) onto (3, 2).

The column vector of this translation is

A $\begin{pmatrix} -5 \\ -1 \end{pmatrix}$ **B** $\begin{pmatrix} 5 \\ -1 \end{pmatrix}$ **C** $\begin{pmatrix} 5 \\ 1 \end{pmatrix}$ **D** $\begin{pmatrix} -5 \\ 1 \end{pmatrix}$

28 The Venn diagram shows the number of elements in each region of the universal set.

$n\,(A \cup B') =$

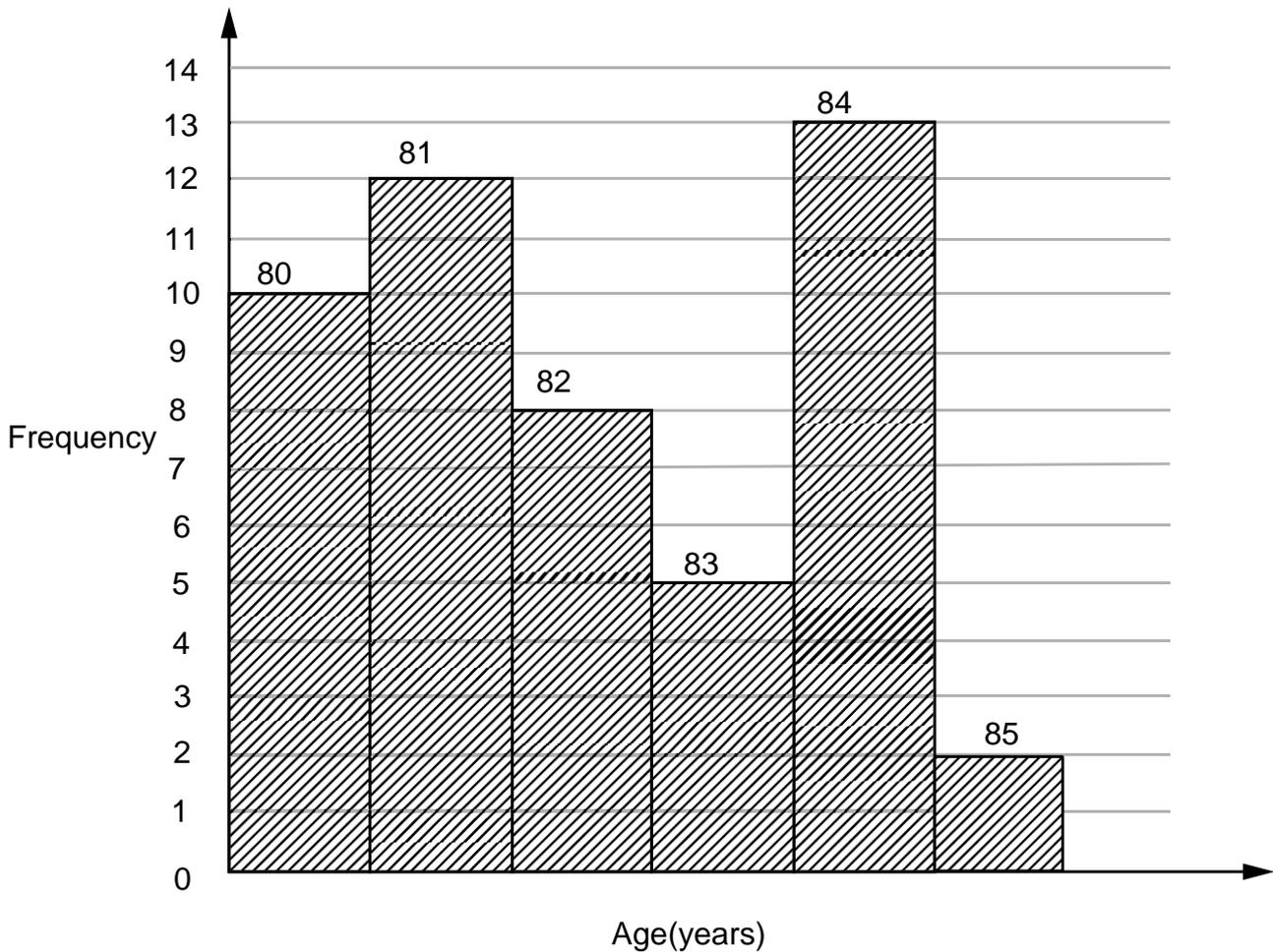**A** 6   **B** 11   **C** 12   **D** 14

29   In 2016, the total number of cell phones sold in December at Jutjana stores was 150.

This was 20 % more than the number of cell phones sold in November.

The number of cell phones sold in November was

A 180   **B** 125   **C** 120   **D** 100

Answer Question **30** and **31** using the bar chart below.

The bar chart shows the ages of old age people in a charity organization.

30   The modal age is

A 81   **B** 82   **C** 83   **D** 84

31   The median age is

A 82   **B** 82.5   **C** 83   **D** 83.5

SECTION B

MULTIPLE CHOICE ANSWER GRID

	A	B	C	D
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				