EXAMINATIONS COUNCIL OF ESWATINI
Junior Certificate Examination

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

MATHEMATICS   **309/01**

Paper 1   **October/November 2022**

                                                                                    2 hours

Candidates answer on the Question Paper.

Additional materials: Geometrical Instruments

                         Tracing paper (optional)

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on the spaces provided.

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.

All working should be clearly shown below each question.

The number of marks is given in brackets [ ] at the end of each question or part question.

Calculators should **not** 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.

3-figure tables may be used in any question where necessary.

The total of the marks for this paper is 100.

For Examiner's Use	
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This document consists of **15** printed pages and **1** blank page.

©ECESWA   **[Turn over**

1 **(a)** Work out

    (i) 1.5×2.31,

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

    (ii) $\dfrac{501}{0.5}$,

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

(b) Write 560 g as a percentage of 2 000 g.

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

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2 **(a)** Round off 399.9584 to

    (i) four significant figures,

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

    (ii) two decimal place.

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

(b) **(i)** Express 0.0000201 , in standard form.

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

    (ii) Evaluate $2^2 \times 8^{-2}$.

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

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3 Given that $x = 4$, $y = -3$ and $z = -\dfrac{3}{5}$,

Find the value of

(a) $x^2 - y^2$,

Answer (a) .... [2]

(b) $\dfrac{y}{z}$.

Answer (b) .... [2]

---

4 The table below shows the number of loaves of bread sold in one particular shop.

Day	Monday	Tuesday	Wednesday
No. of loaves	200	250	

(a) Calculate the percentage increase in the number of loaves sold between Monday and Tuesday.

Answer (a).. % [2]

(b) A 10% decrease in the number of loaves sold is predicted between Tuesday and Wednesday.

Calculate the number of loaves sold on Wednesday.

Answer (b).. [2]

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5 The diagram shows two parallel lines *GFE* and *ABCD*.
CF and BF are cutting lines such that *CBF* is a triangle.
$BF = CF$, $BC = 6$ cm and $BF = 4$ cm and $C\hat{F}E = 50°$.

NOT TO SCALE
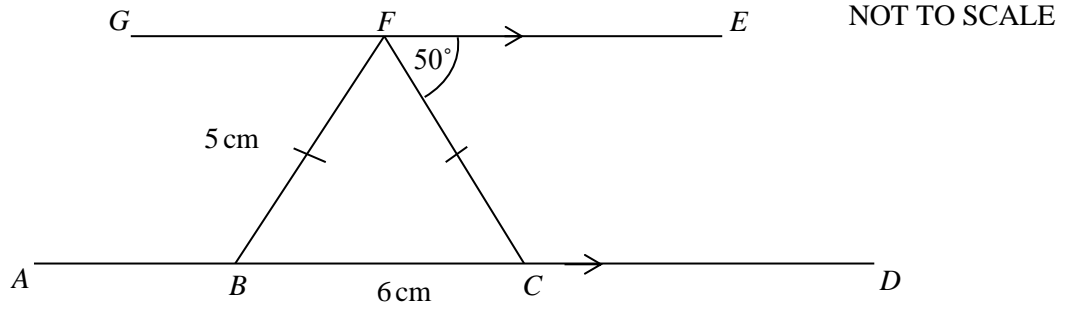
(a) Write down the name given to triangle *BCF*.

Answer (a) .... [1]

(b) Write down the size of $B\hat{C}F$.

Answer (b) ....° [1]

(c) Find $C\hat{F}B$.

Answer (c) ....° [2]

(d) Calculate the perpendicular distance from *BC* to *F*.

Answer (d).. cm [3]

6 Solve

(a) $3 - 4m \geq 9 - m,$

Answer (a)... [2]

(b) $2y - 5 = \dfrac{y}{3}$.

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

7 **(a)** On a particular day in Mbabane, the minimum temperature recorded was $-2°C$. The maximum temperature was $18°C$.

Work out the difference between these two temperatures.

Answer (a) .... °C [2]

(b) Estimate $\dfrac{165.274}{1.692}$, correct to one significant figure.

Answer (b).. [2]

8 Given that $A = \begin{pmatrix} 3 & -1 \\ -2 & 1 \end{pmatrix}$, $B = \begin{pmatrix} 0 \\ -1 \\ 8 \end{pmatrix}$ and $C = \begin{pmatrix} -7 & 4 \\ 5 & 6 \end{pmatrix}$

(a) State the order of matrix B.

Answer (a) .... [1]

(b) Work out

(i) $A + C$,

Answer (b)(i) [2]

(ii) $-3B$.

Answer (b)(ii) [2]

---

9 **(a)** Remove brackets and collect like terms.

$5 + 3(2n - 4) - n$

Answer (a).. [2]

(b) Simplify.

$$\frac{3t}{4} - \frac{5-2t}{2}$$

Answer (b).. [3]

---

10 Describe fully the locus of a point that is always 5 cm from a point *P*.

Answer ....

.... [3]

---

11 Given that $\mathscr{E}$ = {1, 2, 3, 4, 5, 6, 9}

               A = {square numbers}
               B = {factors of 9 }

(a) List the elements of *A*.

Answer (a).. [2]

(b) Show the information on the Venn diagram.
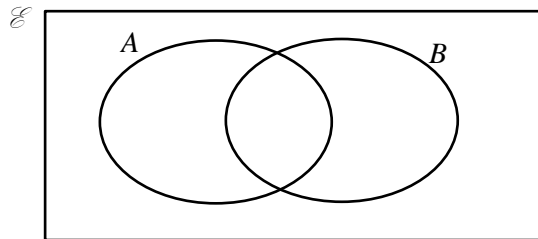
[3]

(c) Write down, *n* (*A* ∪ *B*) .

Answer (c) .... [1]

---

12 The figure below shows a rectangle and a triangle.
The length of the rectangle is $(4x - 2)$ cm and the width is $(x + 1)$ cm.
The dimensions of the triangle are 3 cm, 9 cm and $(2x + 2)$ cm .
Both shapes have the same perimeter.

NOT TO SCALE

$(x+1)$ cm

$(4x - 2)$ cm

$(2x+2)$ cm

3 cm

9 cm
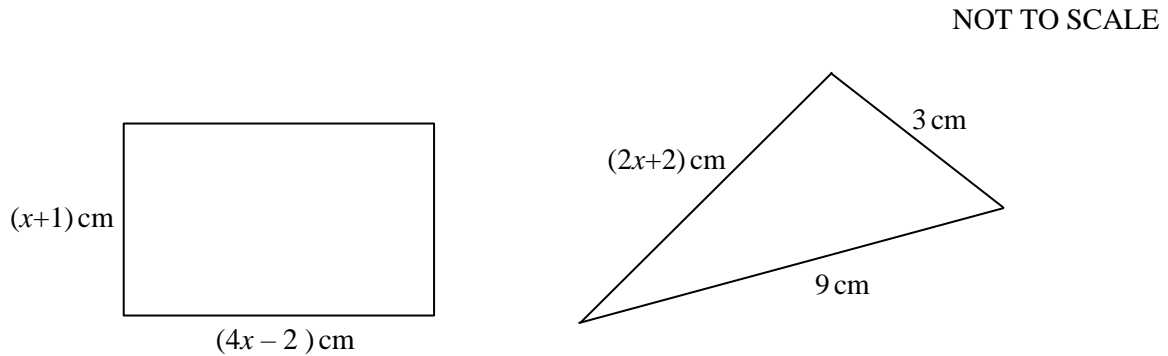
(a) Write down an expression for the perimeter of the rectangle, in its simplest form.

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

(b) **(i)** Form an equation in *x,* relating the perimeters of the two shapes.

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

(ii) Solve for *x* in *(b)*(i) .

Answer (b)(ii) $x =$ .... [2]

(c) Calculate the area of the rectangle.

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

13 The figure shows a circle, centre O.
The circle has a radius of 6 cm and a sector angle of 45°.
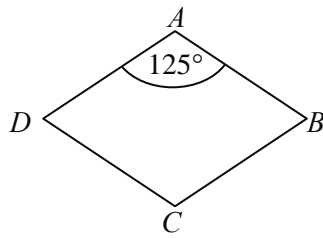
P

6 cm

Q

45°

O
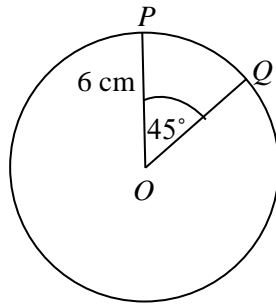
NOT TO SCALE

Calculate

(a) the circumference of the circle,

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

(b) the area of the minor sector *POQ*.

Answer (b) .... cm² [3]

14 The diagram below shows a rhombus *ABCD*.
$BAD = 125°$.

NOT TO SCALE

(a) State the order of rotational symmetry of the rhombus.

Answer (a) .... [1]

(b) Calculate angle *ADC*.

Answer (b) ....° [2]

15 The distribution shows the minimum temperatures recorded in winter for a particular town.

$-6, \; 5, \; 4, \; -3, \; 10, \; 8, \; -11$

(a) Find the median minimum temperature.

Answer (a) ....°C [2]

(b) Calculate the mean minimum temperature.

Answer (b)...° C [2]

16 **(a)** A bus leaves Manzini at 2:35 pm and reaches Nhlangano at 4:30 pm.

Calculate the time taken by the bus to travel from Manzini to Nhlangano.

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

(b) A car travelling at an average speed of 120 km/hr takes 1 hour 30 minutes to reach its destination.

Calculate the distance covered by the car.

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

17 The bearing of *U* from S is 072˚.
The bearing of *V* from S is 112˚.
SU = UV

North

North

NOT TO SCALE

072˚

S

U

North

V
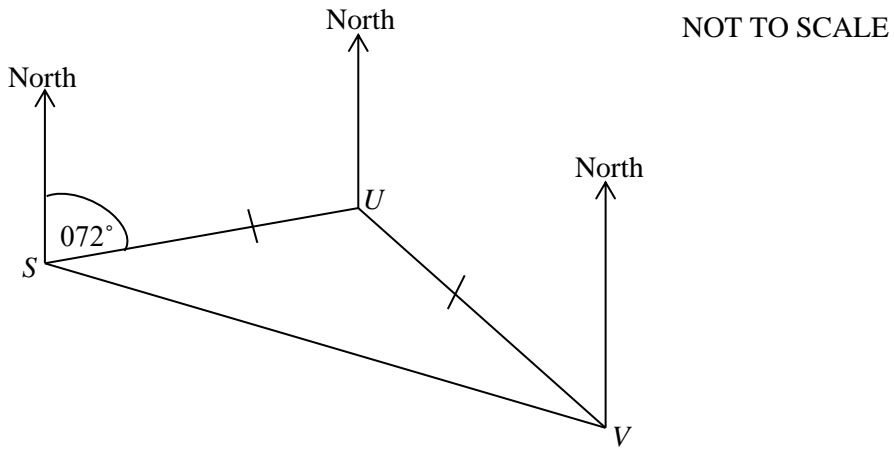
Calculate

(a) $U\hat{S}V$,

Answer (a) .... ˚ [2]

(b) the bearing of *V* from *U*.

Answer (b)...˚ [3]

18   The diagram below shows a prism.
The cross section is a trapezium.

11 cm

3 cm

4 cm

7 cm

NOT TO SCALE
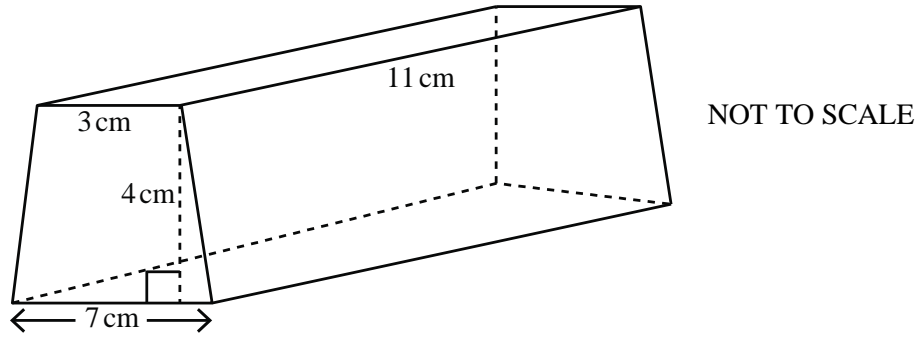
Calculate the volume of the prism.

Answer .... cm³ [3]

19   **(a)**   Write down the name of a seven-sided polygon.

Answer (a) .... [1]

(b)   Calculate the size of each interior angle of a 24-sided regular polygon.

Answer (b) ....˚[2]

20 The table below shows the favourite fruits of 60 learners in a class.

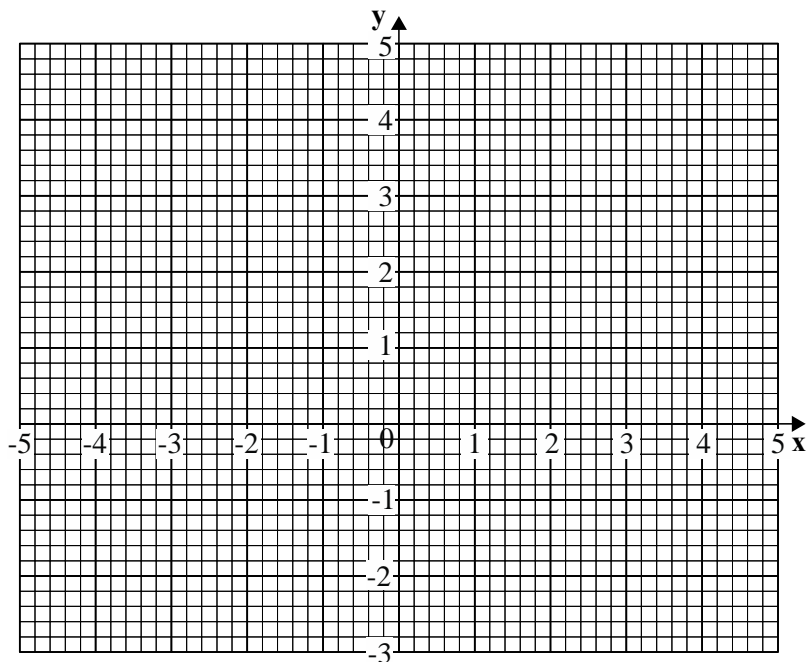| Fruit	Number of learners
Banana	20
Apple	25
Orange	15

(a) Complete the pie chart to show this information.
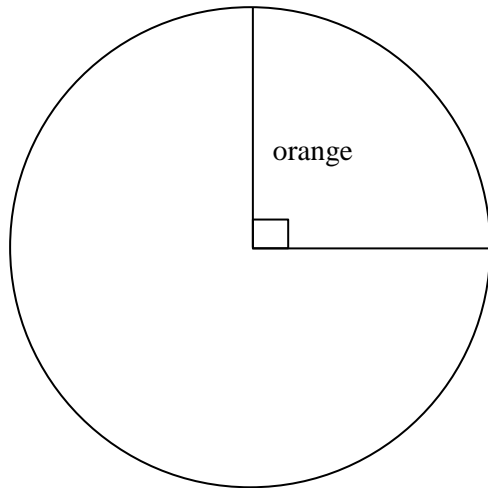
[4]

(b) A learner is chosen at random from the class.
Find the probability that the learner likes banana or apple.

Answer (b) .... [2]

21 **(a)** Show the inequality $x > -2$ on the grid, by shading.

[2]

(b) Find the image of the point (1 , 1) after a rotation, centre (– 1 , 4) through – 90˚, using the grid above.

Answer (b) (,) [2]

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