

Centre Number	Candidate Number	Candidate Name
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NAMIBIA SENIOR SECONDARY CERTIFICATE

MATHEMATICS HIGHER LEVEL

8323/1

PAPER 1

2 hours

Marks 80

2020

Additional Materials: Geometrical instruments
Non programmable calculator

INSTRUCTIONS AND INFORMATION TO CANDIDATES

- Candidates answer on the Question Paper in the spaces provided.
- Write your Centre Number, Candidate Number and Name in the spaces at the top of this page.
- Write in dark blue or black pen.
- You may use a soft pencil for any diagrams or graphs.
- Do not use correction fluid.
- Do not write in the margin *For Examiner's Use*.
- Answer **all** questions.
- If working is needed for any question it must be shown below, or where working is indicated.
- The number of marks is given in brackets [] at the end of each question or part question.
- Non-programmable calculators may 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 for angle sizes to **one** decimal place.
- For π , either use your calculator value, or use 3.142.

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<i>Checker</i>	

This document consists of **14** printed pages and **2** blank page.



Republic of Namibia

MINISTRY OF EDUCATION, ARTS AND CULTURE

- 1 A lake has an area of 63 800 000 000 square metres.

Write this area in square kilometres, correct to 2 significant figures.

Answer km² [2]

- 2 It took Angelica 8 minutes 45 seconds to solve a problem and it took Brian 11 minutes 40 seconds to solve the same problem. Express the ratio of Angelica's time to Brian's time, as simply as possible, in the form $p : q$.

Answer : [2]

3

CAR HIRE TERMS

\$ 2300 per day.

40 kilometres free for each day hired.

Extra distance – \$ 25 per kilometre

- (a) Carmen hires a car for 5 days and drives a total distance of 350 kilometres.
Work out her total cost.

Answer (a) N\$ [2]

- (b) Denzil hires a car for p days and drives a total distance of q kilometres.

Find an expression for the cost, in terms of p and q , and simplify your answer.

Answer (b) [2]

- 4 Given that $x = 2h - 1$ and $y = \frac{h}{3} + 1$, express $2x - 3y - 4$ in terms of h .

Answer [2]

- 5 Towns **A** and **B** are 241 km apart, correct to the nearest kilometre.
John drives from **A** to **B** at a speed of 120 km/h, correct to the nearest 10 km/h.
Find the longest possible time of John's journey, giving your answer in hours and minutes.

Answerhoursminutes [3]

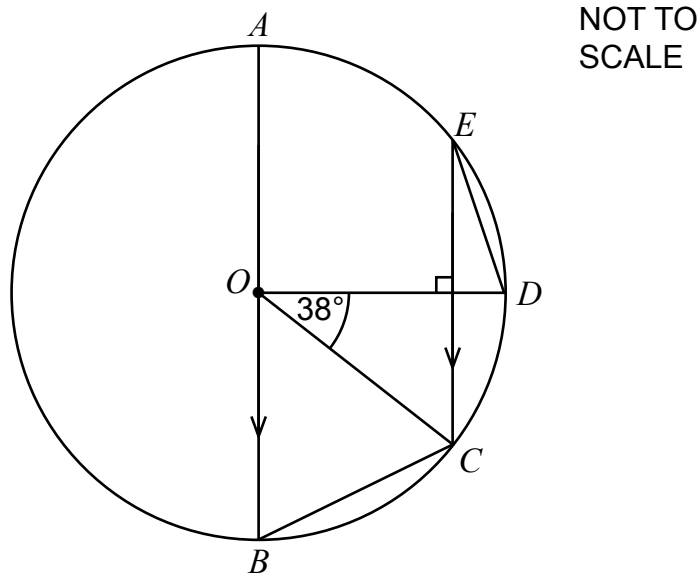
- 6 A regular polygon has n sides.
Each exterior angle is $\frac{5n}{2}$ degrees.
Find the value of n .

Answer $n =$ [3]

- 7 Given that $\frac{m^{\frac{2}{3}}n^{\frac{1}{3}}}{\sqrt[3]{m^5n^{-2}}} = m^p n^q$, find the values of p and q .

Answer $p = \dots\dots\dots q = \dots\dots\dots$ [2]

8



AB is the diameter of a circle, centre O . Points C , D and E lie on the circle.

EC is parallel to AB and perpendicular to OD . Angle DOC is 38° .

Find

(a) angle BOC ,

Answer (a) Angle $BOC = \dots\dots\dots^\circ$ [1]

(b) angle CBO ,

Answer (b) Angle $CBO = \dots\dots\dots^\circ$ [1]

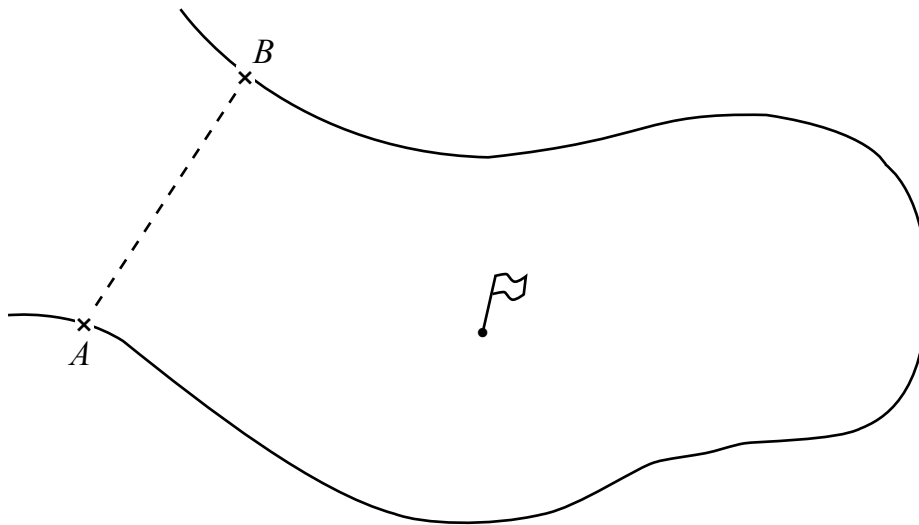
(c) angle EDO .

Answer (c) Angle $EDO = \dots\dots\dots^\circ$ [1]

9 The map shows part of a golf course.

A golfer hits a ball towards the flag but its actual path is always the same distance from A and B .

On the map, draw the path of the ball.



[2]

10 The variables x and y are connected by the equation $y = K(x + 1)^2$, where K is a constant.

Pairs of corresponding values are given in the table below.

x	3	-1	n
y	32	m	8

Calculate

(a) the value of K ,

Answer (a) $K = \dots\dots\dots$ [2]

(b) the value of m ,

Answer (b) $m = \dots\dots\dots$ [1]

(c) the possible values of n .

Answer (c) $n = \dots\dots\dots n = \dots\dots\dots$ [3]

11 The position vectors of points K and L relative to the origin, O , are $\overrightarrow{OK} = \begin{pmatrix} 16 \\ 2 \end{pmatrix}$, $\overrightarrow{OL} = \begin{pmatrix} 4 \\ -3 \end{pmatrix}$. Points M and N are the midpoints of OK and OL respectively.

(a) Express \overrightarrow{MN} as a column vector.

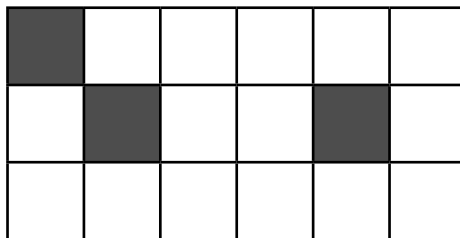
Answer (a) [3]

(b) Find the value of $|\overrightarrow{KL}|$.

Answer (b) [2]

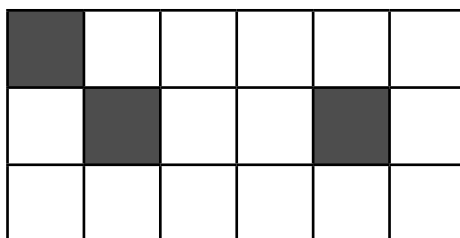
12 Shade **one** square in each diagram so that there is

(a) one line of symmetry,



[1]

(b) rotational symmetry of order 2.



[1]

13 Two similar vases have heights which are in the ratio 3 : 2.

The volume of the larger vase is 1080 cm^3 .

Calculate the volume of the smaller vase.

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

14 A lady golfer from Walvis Bay plays a particular hole many times in a year.

On 30% of all days, there is a wind blowing across the course.

If the wind is blowing, the probability that she hits a straight drive is 0.2, but if the wind is not blowing, the probability that she hits a straight drive, is 0.7.

Find the probability that on a particular day

(a) the wind is not blowing and she hits a straight drive,

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

(b) she hits a straight drive.

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

(c) She plays the hole on two successive days. Find the probability that she does not hit a straight drive on either of the two days.

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

- 15** The table shows information about the time, t minutes, taken by 80 girls to complete their mathematics examination.

Time taken (t minutes)	$40 < t \leq 60$	$60 < t \leq 80$	$80 < t \leq 120$	$120 < t \leq 150$
Frequency	5	14	32	29

- (a) On a histogram, the height of the column for the interval $60 < t \leq 80$ is 2.8 cm. Calculate the height of the column for the interval $80 < t \leq 120$.

Answer (a) height =cm [3]

- (b) Write down the modal interval.

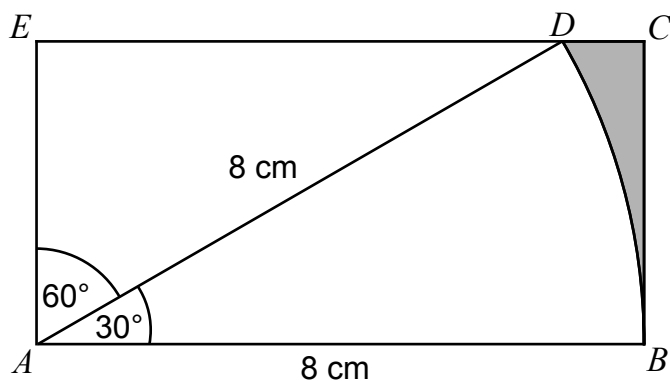
Answer (b) [1]

- 16** The three numbers x , y and 25 have a mean of 27.

Find the value of $x + y$.

Answer: $x + y =$ [2]

17

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The diagram shows a rectangle $ABCE$.

D lies on EC .

DAB is a sector of a circle of radius 8 cm and sector angle 30° .

(a) Calculate the length of AE .

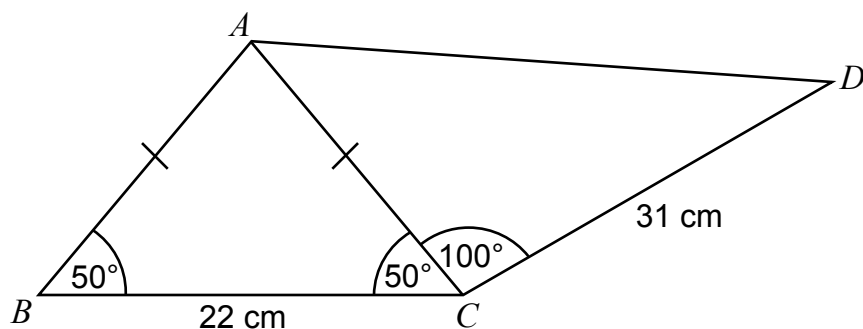
Answer (a) $AE = \dots\dots\dots$ cm [2]

(b) Calculate the area of the sector DAB .

Answer (b) $\dots\dots\dots$ cm² [2]

(c) Calculate the area of the shaded region.

Answer (c) $\dots\dots\dots$ cm² [3]

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The diagram shows the frame of a toy bicycle made from five metal rods.

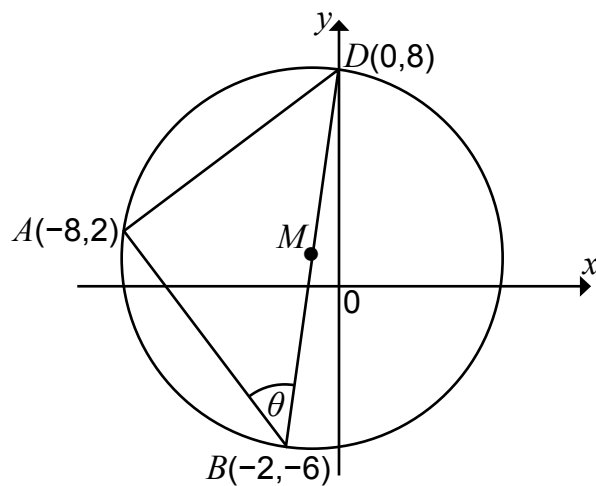
ABC is an isosceles triangle with base 22 cm and base angles 50° .

Angle $ACD = 100^\circ$ and $CD = 31$ cm.

Calculate the length of AD to the nearest whole number.

Answer $AD = \dots\dots\dots$ [4]

- 19 Points $A(-8, 2)$, $B(-2, -6)$ and $D(0, 8)$ are vertices of a triangle that lie on the circumference of a circle. The centre of the circle is M and BD is a diameter of the circle.



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- (a) Calculate the coordinates of M .

Answer (a) [1]

- (b) Show that the equation of the line parallel to BD and passing through the point A is given by $y = 7x + 58$.

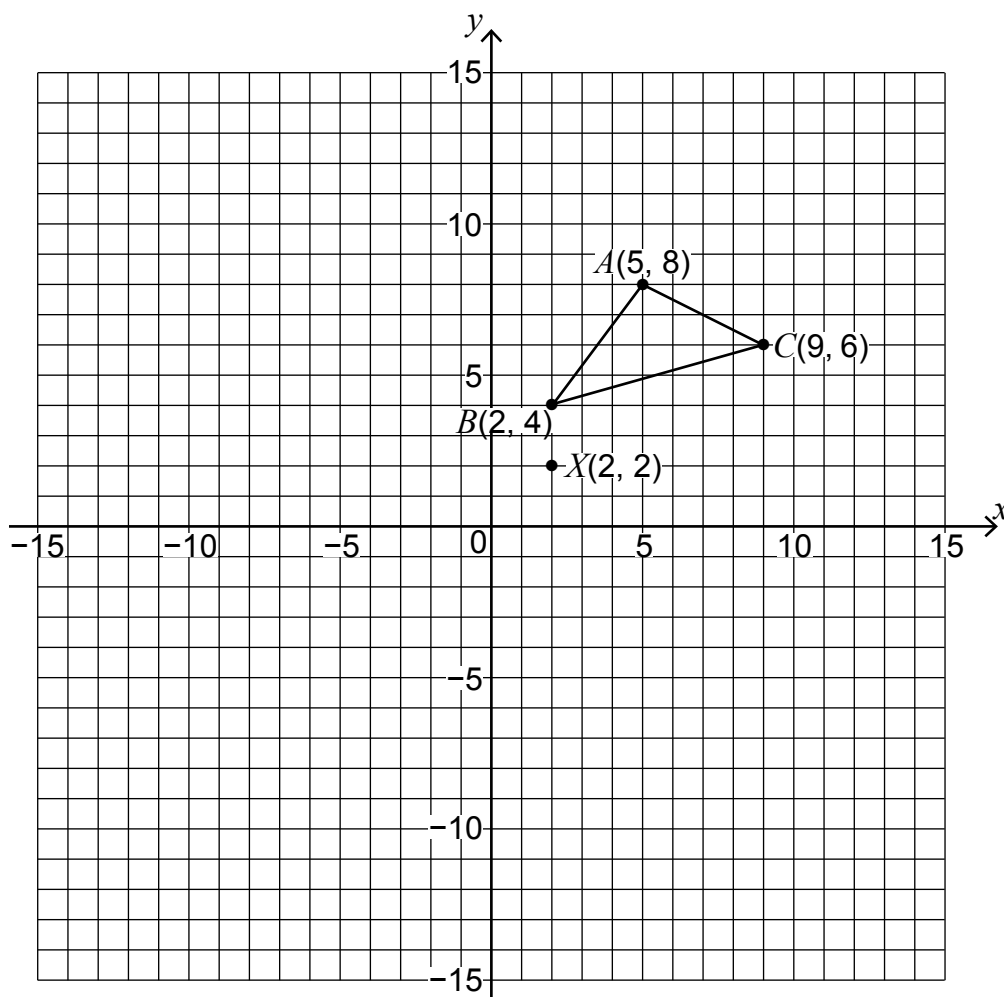
Answer (b)

[2]

- (c) Find the equation of the perpendicular bisector of the line BD .

Give your answer in the form of $ax + by + c = 0$, where a , b and c are integers.

Answer (c) [3]



The diagram above shows a triangle ABC in which A is $(5,8)$, B is $(2,4)$, C is $(9,6)$.

The point X is $(2,2)$.

The following transformations can be applied to the triangle ABC

P reflection in the line $y = x$

Q translation by the vector $\begin{pmatrix} -3 \\ 7 \end{pmatrix}$

R rotation clockwise through 90° about $X(2,2)$.

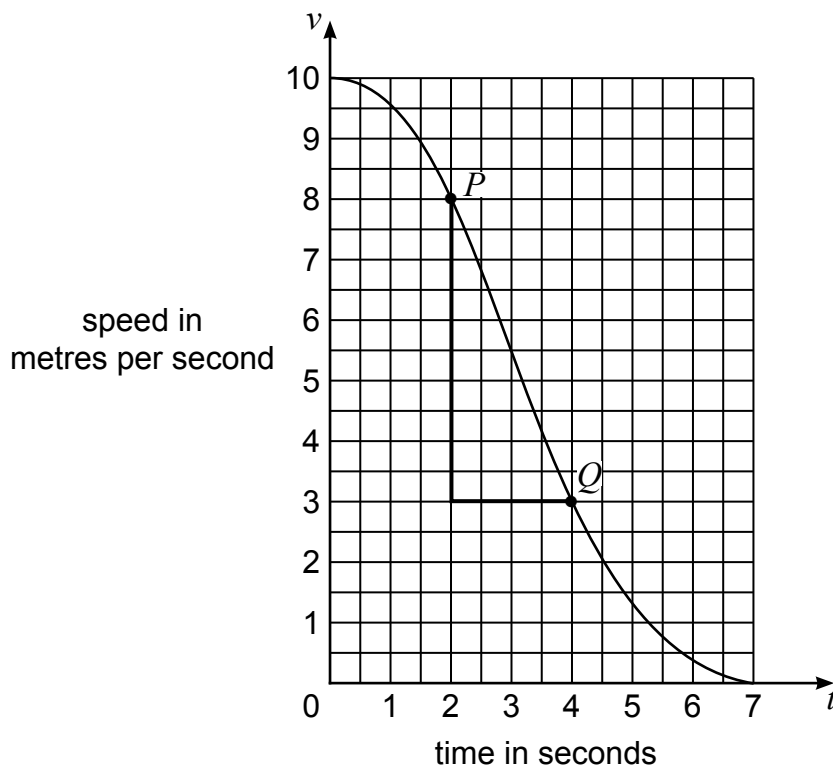
(a) Find the image of point B , when transformation **Q** is applied, followed by transformation **P**.

Answer (a) [2]

(b) Find the image of point C when transformation \mathbf{R} is applied to the triangle ABC .

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

21



The speed–time graph shows how a car comes to rest in 7 seconds.

The part of the graph labelled PQ is a straight line.

Calculate

(a) the deceleration of the car between $t = 2$ and $t = 4$,

Answer (a)..... m/s^2 [2]

(b) the distance travelled between $t = 2$ and $t = 4$,

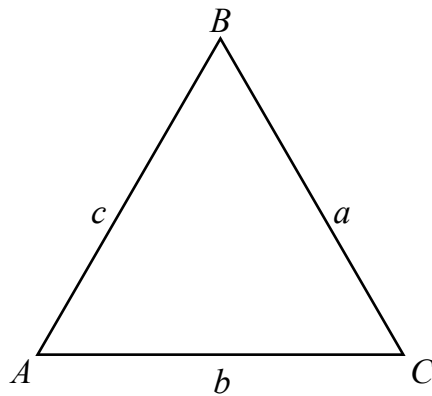
Answer (b)..... m [2]

(c) the speed of the car in **kilometres per hour** when $t = 0$.

Answer (c)km/h [2]

22 Triangle ABC is isosceles with $AB = BC$.

Side $AB = c$, side $BC = a$ and side $AC = b$.



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Prove that $\cos B = 1 - \frac{b^2}{2a^2}$.

[3]

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