



BOTSWANA EXAMINATIONS COUNCIL
Botswana General Certificate of Secondary Education

CANDIDATE
NAME

CENTRE
NUMBER

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CANDIDATE
NUMBER

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MATHEMATICS

Paper 1

0563/01

October/November 2014

1 hour 30 minutes

Candidates answer on the Question Paper.

Additional Materials: Geometrical instruments

READ THESE INSTRUCTIONS FIRST

Write your centre number, candidate number and name in the spaces provided at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

If working is needed for any question it must be shown below that question. Omission of essential working will result in loss of marks.

Do **not** use staples, paper clips, highlighters, glue or correction fluid.

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 50.

If the degree of accuracy is not specified in the question and if the answer is not exact, the answer should be given to three significant figures.

**THE USE OF ANY CALCULATING AID IS NOT
ALLOWED IN THIS PAPER.**

For Examiner's Use

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This document consists of **11** printed pages and **1** blank page.



Mathematical formulae for papers 1 and 2

Surface area and volume of solids

Name of solid	Total surface area	Volume
cone	$\pi r^2 + \pi r l$	$\frac{1}{3} \pi r^2 h$
pyramid		$\frac{1}{3}$ base area x height
sphere	$4\pi r^2$	$\frac{4}{3} \pi r^3$

Trigonometry

Sine Rule $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

Area of a triangle $= \frac{1}{2} ab \sin C$

1 There are two bottles of cooking oil. The first bottle contains 750 ml of cooking oil and the second bottle contains 8% more cooking oil than the first one.

- (a) How much more cooking oil does the second bottle contain?
- (b) Calculate the volume of the cooking oil that is contained in the second bottle.

Answer (a).....ml [2]
 (b).....ml [1]

2 An entire rectangular sheet of paper is divided into small squares of the same area. Each square has an area of 36 cm^2 .

- (a) Calculate the length of side of each square.
- (b) The length of the side of the rectangular sheet of paper is 48 cm. What is the total number of squares that can fit along the length of the rectangular sheet of paper?

Answer (a).....cm [1]
 (b)..... [2]

3 Solve the simultaneous equations $5x - y = 15$ and $3x - y = 5$.

Answer $x =$
 $y =$ [3]



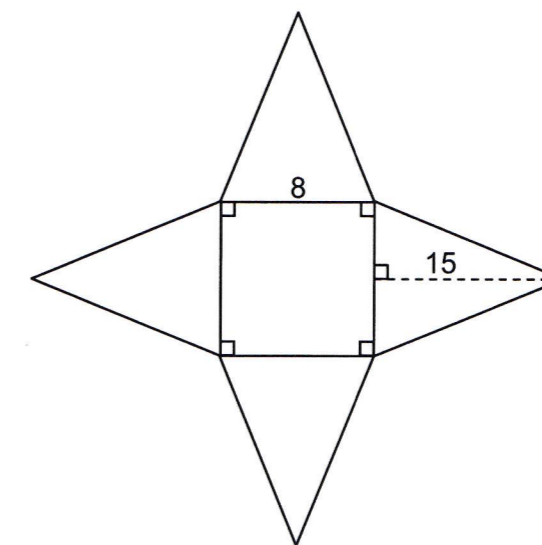
4 Express 0.125 as a fraction in the lowest terms.

Answer [2]

- 5 (a) Express 32 in the form 2^p .
- (b) What is the value of x for which $2^{2x} = 32$?

Answer (a) [1]
 (b) $x =$ [2]

6 The diagram below shows a net of a square based pyramid. The length of side of the square base is 8 cm. The perpendicular height of each triangular face is 15 cm.

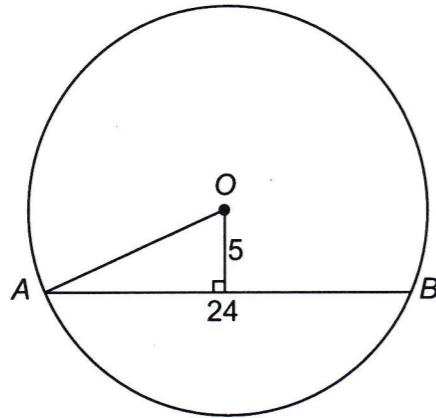


Calculate

- (a) the area of one triangular face,
- (b) the total area of the net.

Answer (a)..... cm^2 [1]
 (b)..... cm^2 [2]

7 The diagram below shows a circle with centre O . The length of chord $AB = 24$ cm. The perpendicular distance of the chord from the centre is 5 cm.



Calculate the radius of the circle.

Answercm [3]

8 Molefe divides his training time into three activities: warm up, speed work and technique in the ratio 1 : 3 : 4 respectively. He trains for 2 hours on each of the 7 days of the week.

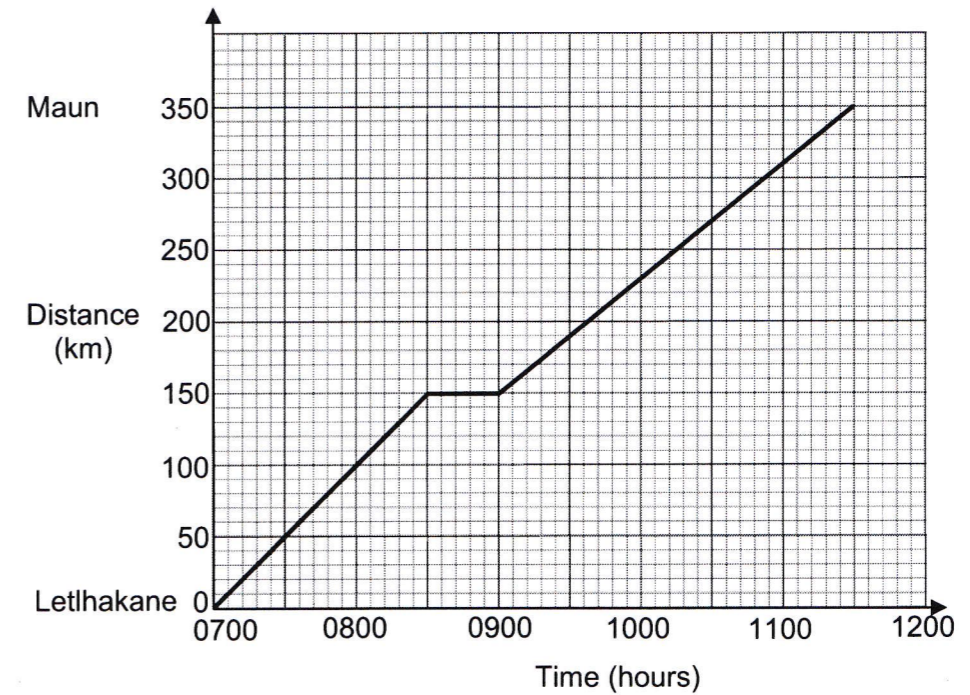
- (a) How many minutes will he spend on warm up in a day?
- (b) What is the total time that will be used for speed work in the entire week? Give your answer in hours and minutes.

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

Answer (b).....hours.....minutes [3]



9 The distance-time graph below shows a journey by a bus from Letlhakane to Maun. The bus had to stop on the way to change a wheel.

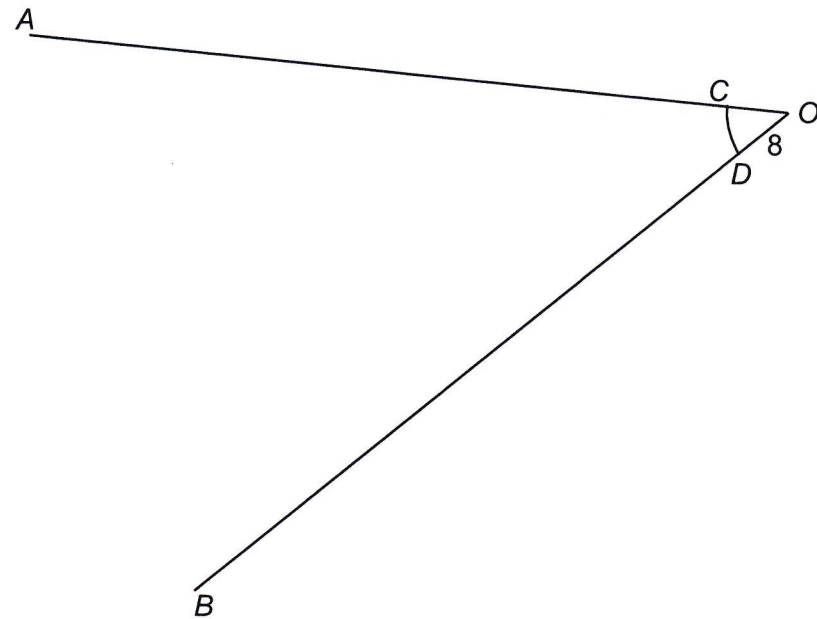


- (a) How long did the bus travel before the wheel was changed? Give your answer in hours and minutes.
- (b) The bus continued with the journey to Maun after the wheel was changed. Calculate the average speed, in km/h, for this part of the journey.

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

(b).....km/h [2]

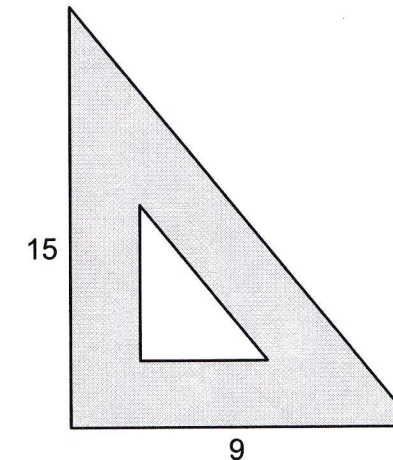
- 10 The diagram below shows javelin field lines OA and OB . The throwing area of the field is shown by the sector OCD . The radius of sector OCD is 8 m.
Scale: 1 cm to 10 m.



- (a) Measure and write down the size of \hat{AOB} .
- (b) An athlete throws the javelin such that it lands equidistant from OA and OB .
Construct the locus of points that shows the possible places where the javelin lands. [2]
- (c) Another athlete throws a javelin so that it lands 80 m from the centre of the throw line, CD .
Construct the locus of points showing all possible positions where the javelin may land. [2]

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

- 11 The diagram below shows the cross-section, shown shaded, of a mathematical instrument. The length of the base of the instrument is 9 cm and the height is 15 cm. The base and the height of the instrument are at right angles.



- (a) Calculate the area of the outer triangle.
- (b) The base and height of the inner triangle are each $\frac{1}{3}$ of the base and height of the outer triangle.
Calculate
- (i) the height of the inner triangle,
- (ii) the area of the shaded part.

Answer (a).....cm² [2]

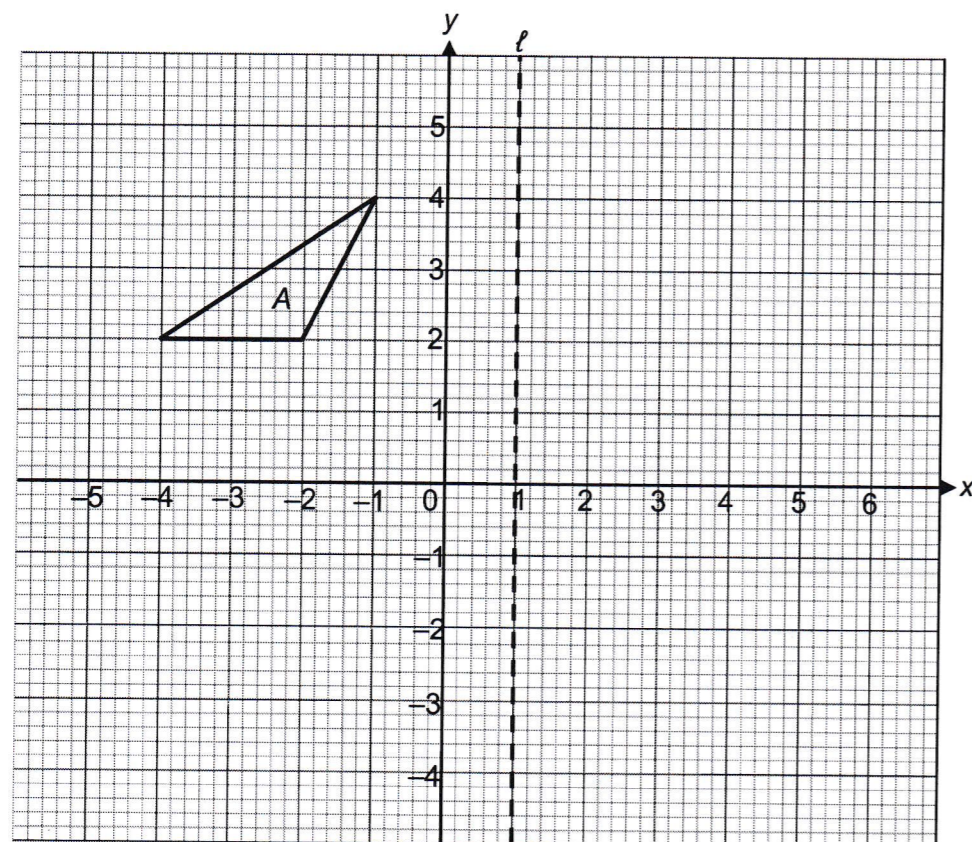
(b) (i)cm [1]

(ii)cm² [2]

- 12 Express $\frac{2}{5} - \frac{4}{y+3}$ as a single fraction.

Answer [2]

13 The diagram below shows triangle A and line ℓ .



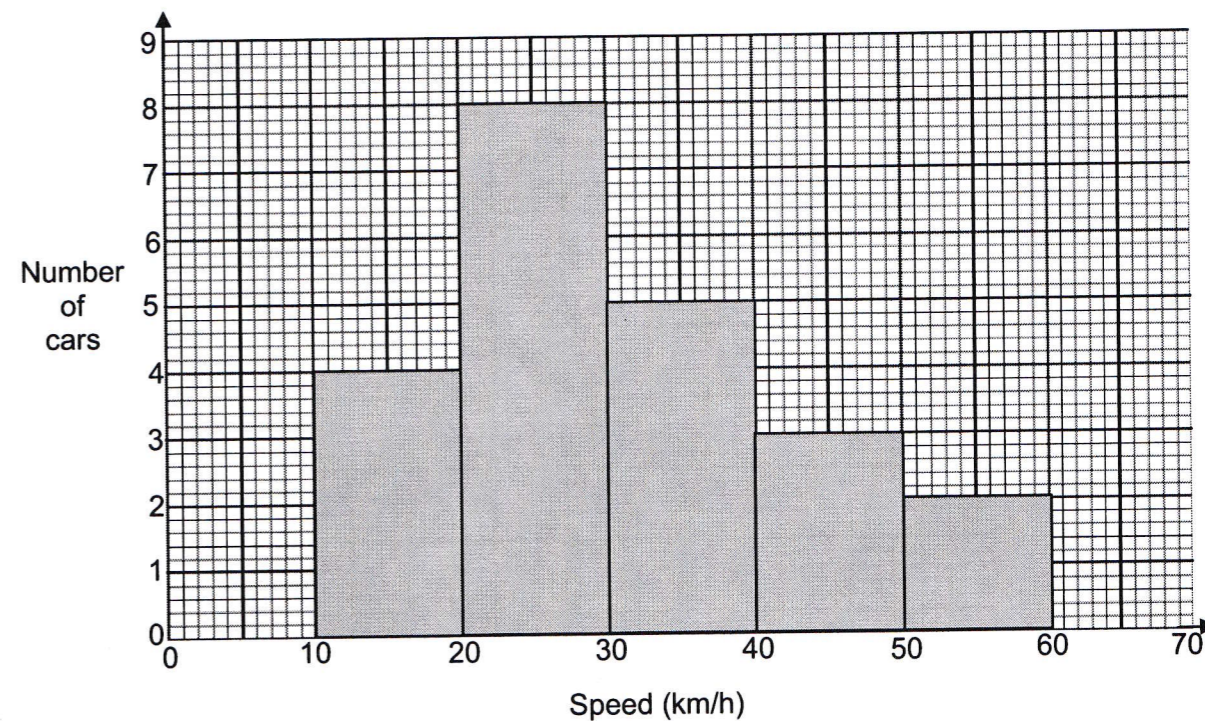
- (a) What is the equation of line ℓ ?
- (b) Reflect triangle A in the line ℓ . Label the image B.

[2]

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



14 The histogram below shows the speeds, in km/h, of 22 cars recorded at a point.



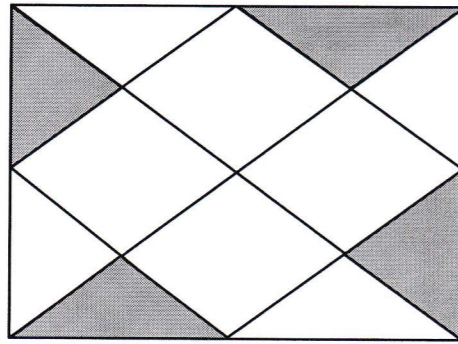
- (a) What is
 - (i) the modal class,
 - (ii) the mid-value of the class showing the number of cars between 10 km/h and 20 km/h?
- (b) On the diagram above, draw a frequency polygon that shows the information in the histogram. [2]
- (c) What is the probability that a car passing at the point travels at a speed between 40 km/h and 50 km/h?

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

(ii)..... [1]

(c)..... [1]

15 Describe fully the symmetry of the figure below.



Answer [2]



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