BOTSWANA EXAMINATIONS COUNCIL
in collaboration with
UNIVERSITY OF CAMBRIDGE LOCAL EXAMINATIONS SYNDICATE
Botswana General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

MATHEMATICS **0563/01**

Paper 1 **October/November 2009**

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

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

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Mathematical formulae for papers 1 and 2

Surface area and volume of solids

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

Trigonometry

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

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

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

For Examiner's Use

1 A garbage collection company used to charge P2.50 per week.
The charge is now increased to P10 per week.

(a) By how much money has the charge been increased?

(b) Calculate the percentage increase in the charge.

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

(*b*)..... [2]

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2 A power company announced that the power was going to be cut from 8 am to 5.45 pm.

(a) Write down 5.45 pm in 24-hour clock notation.

(b) For how long, in hours and minutes, was the power going to be cut?

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

(*b*)..... hours ..... minutes [2]

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3 To make 20 litres of ginger drink, 150 g of powdered ginger is used.
How much powdered ginger, in grams, is required to make 160 litres of the drink?

Answer ..... g [2]

For Examiner's Use

4 An isosceles triangle JKL is such that $JK = 11$ cm, $L\hat{J}K = 55°$ and $LJ = LK$.

(a) In the space provided below, construct triangle JKL. [2]

(b) Measure and write down the length of LK.

Answer (*b*)..... cm [1]

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5 Solve the inequality $5 - 3p \geqslant 7$.

Answer ..... [2]

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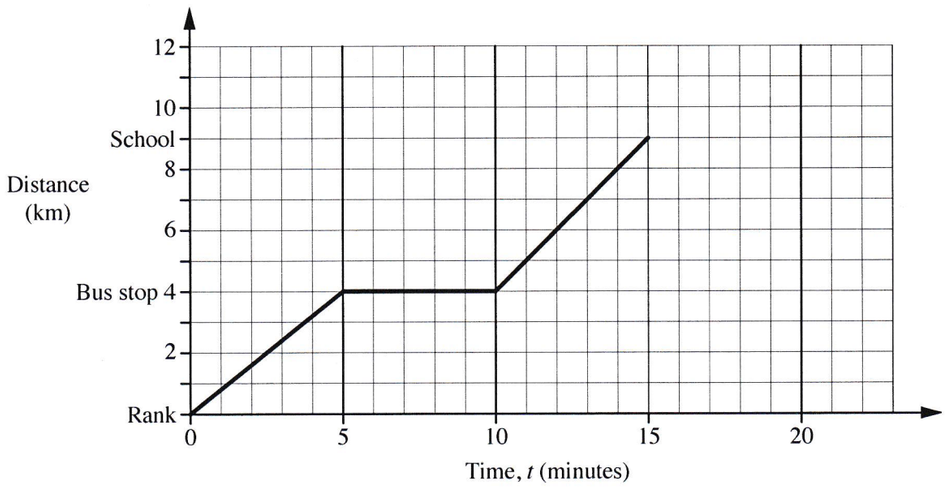
6 The diagram shows the distance-time graph of a taxi from the rank to the school via the bus stop.



(a) How far is the bus stop from the school?
(b) What was the speed of the taxi between $t = 5$ and $t = 10$?
(c) Calculate the average speed of the taxi, in km/h, from the rank to the school.
(d) From the school, the taxi went back to the rank, arriving in 6 minutes.
Complete the graph to show this part of the journey. [1]

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

(*b*) .....km/min [1]

(*c*) ..... km/h [2]

7 For each game of football that it plays, a team is awarded points as follows:
3 for a win, 1 for a draw and 0 for a loss.

(a) A team earned 48 points after a number of wins and 6 draws.
How many games did the team win?

(b) One way in which a team can earn 25 points from 19 games is through 5 wins, 10 draws and 4 losses.
Write down another possible way of earning 25 points from 19 games.

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

(*b*) ..... [1]

8 Solve the following pair of simultaneous equations.

$$2x + 5y = 19$$
$$3y - x = 7$$

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

9 **(a)** An organization provides electricity to 24 598 homes.
Write this number in standard form, correct to 2 significant figures.

(b) Approximate the value of $\frac{279 \times 12}{3.7}$.

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

(*b*)..... [2]

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10 Write down all the rectangle numbers between 11 and 19.

Answer ..... [2]

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11 The area of an office floor is $9.8\,m^2$.
What is the area of the floor in cm^2?

Answer ..... cm^2 [2]

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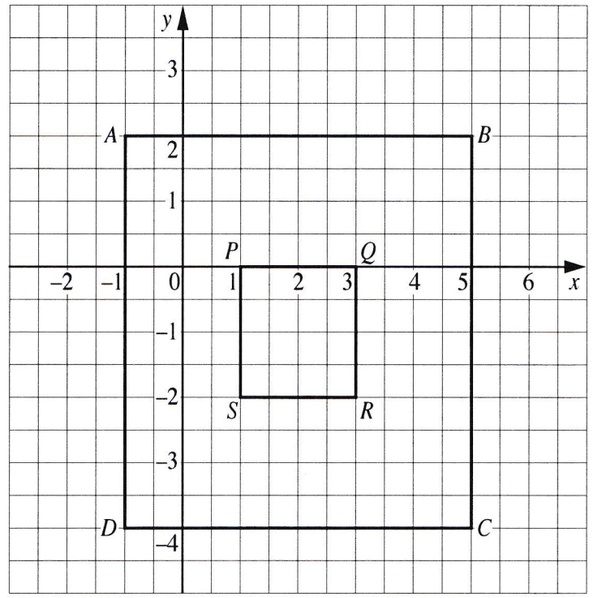
12 In the diagram below, square *ABCD* is mapped onto square *PQRS* by an enlargement.



Describe fully the enlargement.

Answer .....

..... [2]

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13 A table top is in the form of a regular pentagon.
Calculate the size of each interior angle of the table top.

Answer ..... [2]

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14 The scale of a map is 1:250.
Calculate the actual length, in metres, represented by 2 cm on the map.

Answer ..... m [2]

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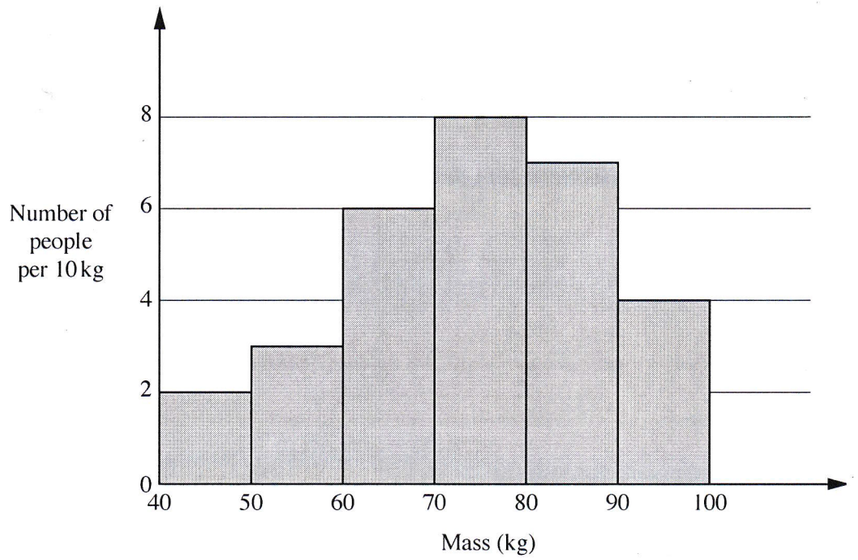
15 The histogram below shows the masses of a group of people.



(a) How many people were in the group?
(b) Write down the modal class.
(c) A person is chosen at random from the group.
What is the probability that the person's mass is less than or equal to 70 kg?

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

(*b*)..... [1]

(*c*)..... [1]

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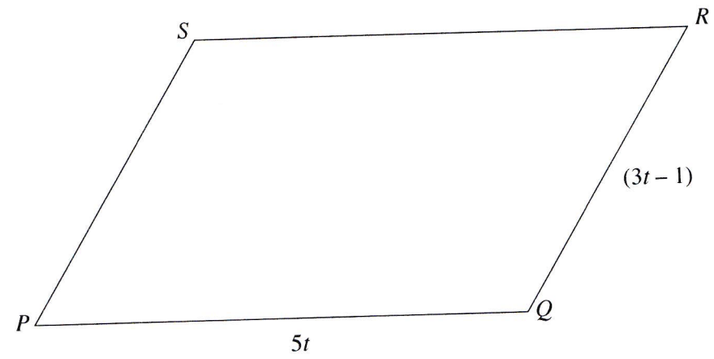
16 The diagram below shows a picture frame in the form of a parallelogram $PQRS$.
$PQ = 5t$ cm and $QR = (3t - 1)$ cm.



(a) Write down an expression, in terms of t, for the perimeter of the frame.
(b) Given that the perimeter of the frame is 62 cm, form an equation in t.
(c) Solve the equation in part **(b)**.
(d) Calculate the length of the shorter side of the frame.

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

(*b*)..... [1]

(*c*) $t =$..... [1]

(*d*)..... cm [2]

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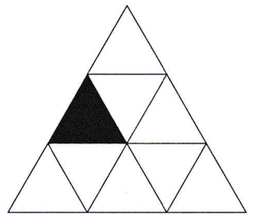
17 The diagram shows a figure made from equilateral triangles.
One of the triangles is shaded.



(a) How many lines of symmetry does the figure have?

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

(b) Shade two more triangles so that the figure has rotational symmetry of order 3. [1]

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18 Kaone tossed a die 100 times.
The table below shows his results.

Score	*Frequency*
1	14
2	26
3	37
4	11
5	9
6	3

Find
(a) the lower quartile,
(b) the upper quartile,
(c) the interquartile range for Kaone's scores.

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

(*b*)..... [1]

(*c*)..... [1]

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