BOTSWANA EXAMINATIONS COUNCIL
Botswana General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

MATHEMATICS

Paper 1

0563/01

October/November 2015

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 **10** printed pages and **2** blank pages.

[Turn over

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 x 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 Chicken costs P19.40 per kg.

Calculate the cost of 8 kg of chicken.

Answer P ..... [2]

2 A farmer has 560 cattle that were tested for foot and mouth disease. Of these, 90% tested positive for the disease.

Calculate the number of cattle that were free of foot and mouth disease.

Answer ..... [2]

3 The distribution below shows the masses, in kg, at birth, of 9 babies.

3.6, 4.5, 2.9, 3.3, 2.7, 3.9, 2.8, 4.4, 3.4 .

Calculate

(a) the median mass,

(b) the mean mass of the babies.

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

(b) ..... kg [2]

For Examiner's Use

4 An urn contains 15 litres of tea. The tea is emptied into cups such that each cup holds 125 ml of tea.

Calculate the total number of cups that can be filled from the 15 litres of tea.

Answer ..... cups [2]

5 A customer's bank balance is in arrears of P545 . The customer deposits P720 into the account to clear the arrears.

What is the customer's new bank balance?

Answer P ..... [2]

6 The number of participants and officials at a sports field is 1575 . The ratio of the number of officials to the number of participants is 1 : 34 .

Calculate the number of officials at the sports field.

Answer ..... [2]

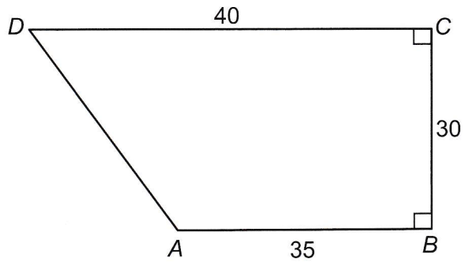
For Examiner's Use

7 Ame lives 3.8 km from the school, *S*. The position of the school is marked *S* in the space below.

Using a scale of 1 cm to represent 1 km, draw the locus of points that shows the positions of where Ame lives.

[2]

8 The diagram below shows a plot, *ABCD*, in the form of a trapezium. The plot is such that *AB* = 35 m, *BC* = 30 m and *CD* = 40 m.



(a) Calculate the area of the plot.

(b) The plot is sold such that each square metre costs P80.

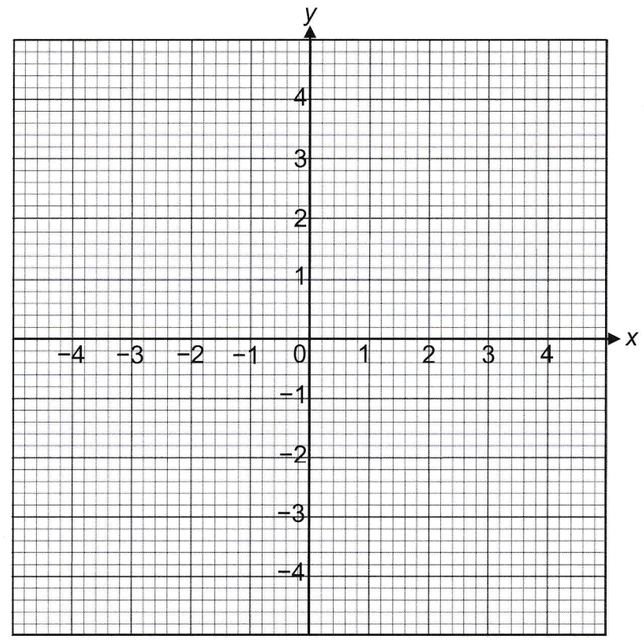
Calculate the total cost of the plot.

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

(b) P..... [2]

For Examiner's Use

9 **(a)** On the axes provided, draw the graph of $y = x + 1$ for $-4 \leq x \leq 4$. [1]



(b) Show, by shading the **unwanted** region, the set of points satisfying the inequality $y \geq x + 1$. [2]

10 The number of diagonals of a polygon is given by $\frac{n(n-3)}{2}$, where n is the number of sides of the polygon.

Calculate the number of diagonals of a polygon that has 11 sides.

Answer ..... [2]

For Examiner's Use

11 A 250 g packet of phane costs Px. Mpho buys 5 packets of phane.

(a) Express, in terms of x, the total amount of money needed to buy the 5 packets.

(b) The total amount of money needed by Mpho for the 5 packets of phane is P22.50 .

(i) Form an equation, in terms of x, to represent this information.

(ii) Solve the equation in **(b)(i)**.

(iii) Hence, or otherwise find the cost of 2 packets of phane.

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

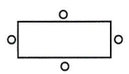
(b) (i) ..... [1]

(ii) ..... [2]

(iii) P ..... [1]

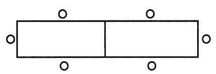
12 The diagrams below show an arrangement of chairs around one table, two tables and three tables forming the beginning of a sequence from the first term to the third term.

Diagram 1



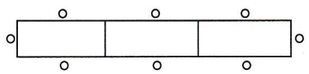
4 chairs

Diagram 2



6 chairs

Diagram 3



8 chairs

(a) How many chairs will be needed in diagram 4?

(b) Write down an expression, in terms of n, for the number of chairs in diagram n.

(c) How many tables are needed for 84 chairs?

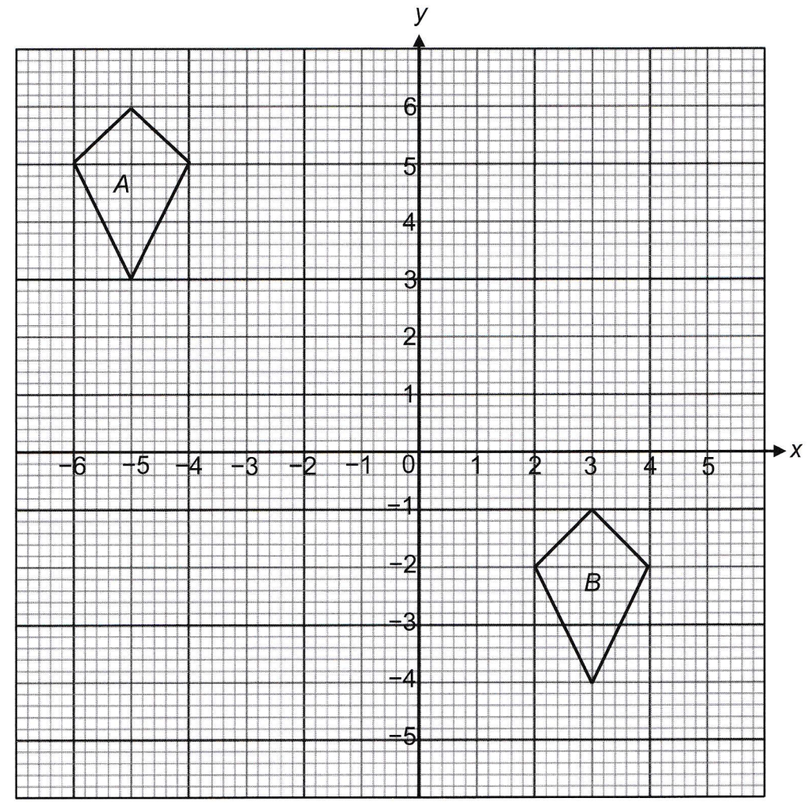
Answer *(a)* ..... [1]

(b) ..... [2]

(c) ..... [2]

For Examiner's Use

13 The diagram below shows kite A and kite B.



Describe fully a single transformation that maps kite A onto kite B.

Answer ..... [2]

For Examiner's Use

14 The coordinates of the point P are (–3, 4), the point Q are (2, –5) and $\overrightarrow{PR} = \begin{pmatrix} 5 \\ -12 \end{pmatrix}$.

(a) What are the coordinates of the point R?

(b) Write down $\overrightarrow{QR}$ as column vector.

(c) Calculate the magnitude of PR.

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

(b) [ ] [2]

(c) ..... units [2]

15 The information below shows the starting times of some television programmes.

Time	Programme
05 30	News
06 35	Breakfast Show
08 00	Fairy Teller
09 05	Prime Series

(a) How many minutes are there between the starting time of Breakfast Show and the starting time of Fairy Teller?

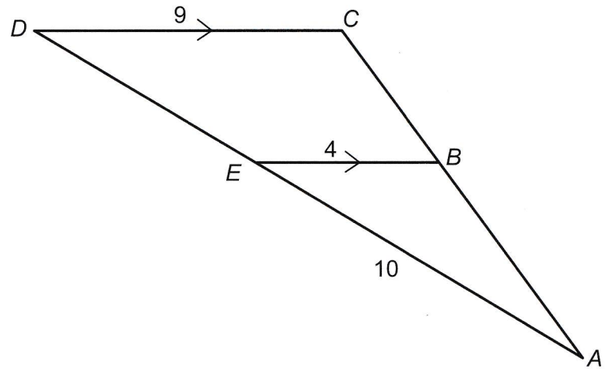
(b) Prime Series lasts for 1 hour 35 minutes.
At what time does it end?

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

(b) ..... [2]

For Examiner's Use

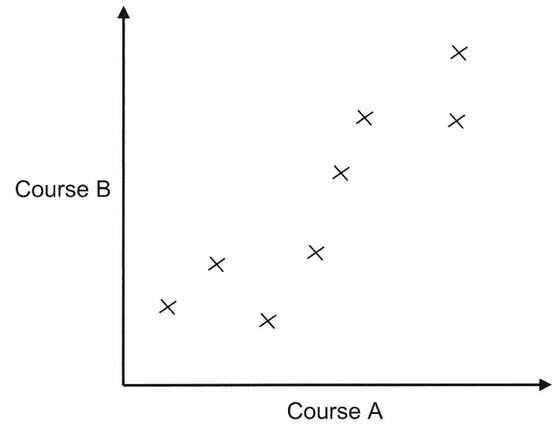
16 The diagram below shows two similar triangles ACD and ABE. AE = 10 cm, EB = 4 cm and DC = 9 cm. DC and EB are parallel.



Calculate the length of AD.

Answer ..... cm [2]

17 The scatter graph below shows the relationship of marks scored on two courses, A and B.



(a) Describe the correlation between the marks of Course A and those of Course B.

(b) On the same graph, draw the line of best fit for the marks of the two courses. [1]

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