MINISTRY OF EDUCATION, BOTSWANA
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 2007**

**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.**

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| |

This document consists of **12** printed 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 $\times$ 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 $\quad = \frac{1}{2}ab \sin C$

**1** Thapelo has 120 millilitres of cough mixture.
He takes the mixture 3 times a day in quantities of 10 millilitres each.

**(a)** How many millilitres does he take in a day?

**(b)** How many days will the mixture last?

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

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

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**2** Mrs Kago has a rectangular plot measuring 30 m by 25 m.

**(a)** Calculate the area of the plot in square metres.

**(b)** Mrs Kago sells the plot at P42 per square metre.
Calculate the total cost of the plot.

*Answer* (*a*)..... $m^2$ [1]

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

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**3** **(a)** Work out $2 + 4 \div \frac{1}{2} - 9$.

**(b)** Given that $\frac{1}{4} = n^2$, find $n$.

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

(*b*) $n$ = ..... [1]

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**4** Kenna made a call from a phone shop.
She paid P19.20 for the 24 units she used.

Calculate the cost of one unit.

*Answer* P..... [2]

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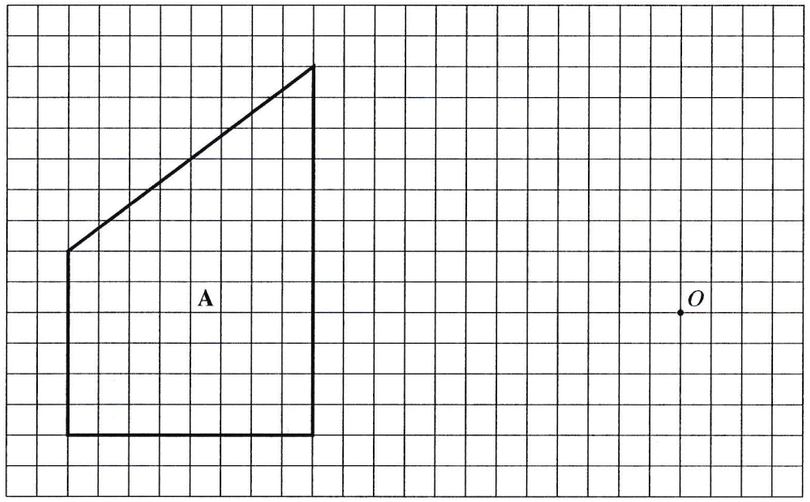
**5** The diagram shows figure **A** and a point, $O$.
On the diagram, draw the image of **A** under an enlargement, centre $O$, scale factor $\frac{1}{2}$. [2]




**6** Which of the following numbers are irrational?

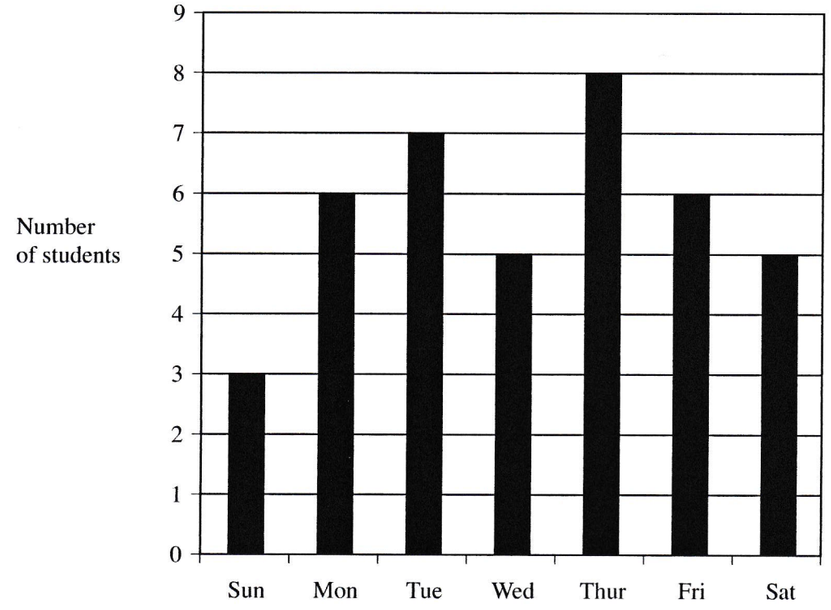
$$\frac{1}{2}, \quad \pi, \quad \sqrt{7}, \quad -\frac{3}{7}, \quad 1.7, \quad \frac{\sqrt{3}}{3}$$

*Answer* ..... [2]





**7** The bar chart below shows the day of birth for a group of students.




**(a)** What is the modal day of birth for the group?

**(b)** Find the total number of students in the group.

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

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

**8** The timetable for meals in an institution is given below.

| *Meal* | *Starts* | *Ends* |
|---|---|---|
| Morning tea | 1000 | 1045 |
| Lunch | 1230 | 1400 |
| Afternoon tea | 1530 | 1600 |
| Supper | 1800 | 1930 |

**(a)** How long, in minutes, is the morning tea?

**(b)** Lesego notices that the time is 1859 and he wants to go for supper.
How much time, in minutes, does he have before supper ends?

**(c)** Kgabo arrives 35 minutes after the start of lunch.
Write down, using the 12-hour clock notation, the time she arrives.

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

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

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





**9** A straight line, $l$, has gradient 2 and passes through the point (0, 3).

**(a)** Write down the equation of $l$.

**(b)** Find the coordinates of the point where $l$ crosses the $x$-axis.

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

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

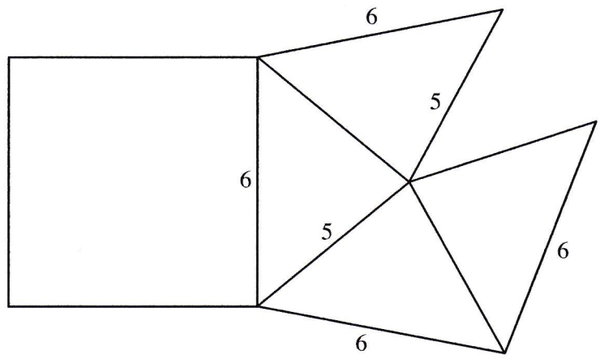
**10** In a competition, a sum of money is used for the first, second and third prizes in the ratio 3 : 2 : 1.
An amount of P3200 is used for the second prize.
Calculate the total sum of money used for the three prizes.

*Answer* P..... [2]

**11** Factorise $12a^2 - 3b^2$ completely.

*Answer* ..... [2]

**12** The diagram shows a net of a container made of cardboard.
The base is a square of side 6 cm. The other four faces are isosceles triangles with base 6 cm and the other two sides 5 cm each.




**(a)** What is the geometrical name of the container?

**(b)** Calculate

**(i)** the height of one triangular face,

**(ii)** the surface area of the net.

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

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

(ii)..... $cm^2$ [3]





**13** A rectangular table cloth has length $l$ and width $w$.
The length is 25 cm less than three times the width.

**(a)** Express $l$ in terms of $w$.

**(b)** The length of the cloth is 71 cm.

**(i)** Form an equation in $w$ to represent this information.

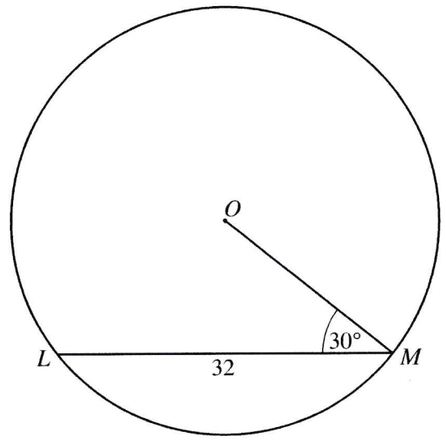
**(ii)** Find the width of the table cloth.

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

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

(ii).....cm [2]

**14** In the diagram, $O$ is the centre of a circle and $LM$ is a chord such that $L\hat{M}O = 30°$ and $LM = 32$ cm.




sin 30° = 0.500
cos 30° = 0.866
tan 30° = 0.577

Using as much of the given information as necessary, calculate the distance of $LM$ from the centre of the circle.

*Answer* .....cm [3]

**15** Each student in a group chose one subject from the following:

Art, Design & Technology, Home Economics and Religious Education.

The students' choices were to be represented in a pie chart.
**(You do not need to draw the pie chart.)**

The table below shows the sector angles of the pie chart.

| *Subject* | *Sector angle* |
|---|---|
| Art | 65° |
| Design & Technology | 75° |
| Home Economics | 100° |
| Religious Education | 120° |

**(a)** Home Economics was chosen by 20 students.
Calculate the total number of students in the group.

**(b)** A student was picked at random from the group.
What is the probability that the student chose Art?

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

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





**16** Triangle *ABC* is such that *AB* = 7 cm, *BC* = 4 cm and $A\hat{B}C = 65°$.

**(a) Showing all constructions lines**, construct triangle *ABC*. [2]

**(b)** Measure and write down the length of *AC*.

**(c) Showing all construction lines**, construct, on the same diagram, the angle bisector of $A\hat{B}C$. [2]

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