

MOCK EXAM 3
MATHEMATICS Compulsory Part
PAPER 1
Question-Answer Book

Name: _____

(2 $\frac{1}{4}$ hours)

This paper must be answered in English

INSTRUCTIONS

1. Write your name in the space provided on Page 1.
2. This paper consists of **THREE** sections, A(1), A(2), and B.
3. Attempt **ALL** questions in this paper. Write your answers in the spaces provided in this Question-Answer Book. Do not write in the margins. Answers written in the margins will not be marked.
4. Graph paper and supplementary answer sheets will be supplied on request. Write your name on the graph paper and supplementary answer sheets.
5. Unless otherwise specified, all working must be clearly shown.
6. Unless otherwise specified, numerical answers should be either exact or correct to 3 significant figures.
7. The diagrams in this paper are not necessarily drawn to scale.

3. The table below shows the distribution of the numbers of children in some families.

Number of children	0	1	2	3	4
Number of families	5	20	17	6	2

Find the median, the mode and the standard deviation of the above distribution. (3 marks)

4. Consider the formula $3(x - 2y) = 6x - 4$.

- (a) Make y the subject of the above formula.
- (b) If the value of x is increased by 4, write down the change in the value of y . (4 marks)

Answers written in the margins will not be marked.

7. In Figure 1, D is a point lying on BC such that $\angle DAC = \angle ABD$.

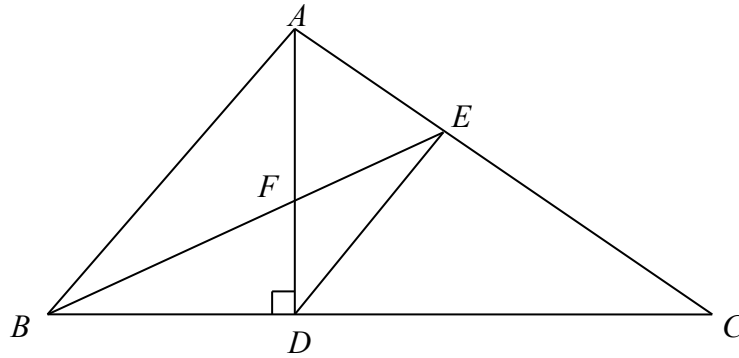


Figure 1

- (a) Prove that $\triangle ABC \sim \triangle DAC$.
- (b) If $\angle DEC = 90^\circ$,
 - (i) Write down all the triangle(s) which is/are similar to $\triangle ABC$ other than $\triangle DAC$.
 - (ii) Write down another pair of similar triangles other than those in (i). (4 marks)

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

9. In Figure 2, the volume of the solid right prism $ABCDEFGH$ is $1\,440\text{ cm}^3$. The base $ABCD$ of the prism is a rhombus. It is given that $AC = 16\text{ cm}$ and $DE = 15\text{ cm}$.

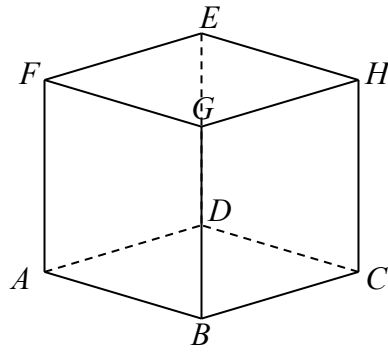


Figure 2

Find

- (a) the length of BD ,
- (b) the total surface area of the prism $ABCDEFGH$. (5 marks)

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

SECTION A(2) (35 marks)

10. The heights (in cm) of the students in Group *A* are shown as follows:

118	121	121	121	124	124	126	129	132	133
134	138	142	145	146	146	147	150	152	153

- (a) Write down the median and the mode of the heights of the students in Group *A*. (2 marks)
- (b) The stem-and-leaf diagram below shows the distribution of heights of the students in Group *B*. It is given that the range of this distribution is 37.

Stem (tens)	Leaf (units)				
10	<i>a</i>	3	4	9	
11	3	4	8		
12	5	8	9	9	
13	1	5	5	<i>b</i>	

- (i) Find *a* and *b*.
- (ii) A student is randomly selected as the representative from each group. If the sum of their heights is between 250 cm and 260 cm inclusive, they can join a competition. Find the probability that the two selected representatives can join the competition. (4 marks)

Answers written in the margins will not be marked.

12. Figure 3 shows a frustum with the height of 8 cm. The radii of the upper surface and lower surface are in the ratio of 3 : 5 and the volume of the frustum is $1176\pi \text{ cm}^3$.

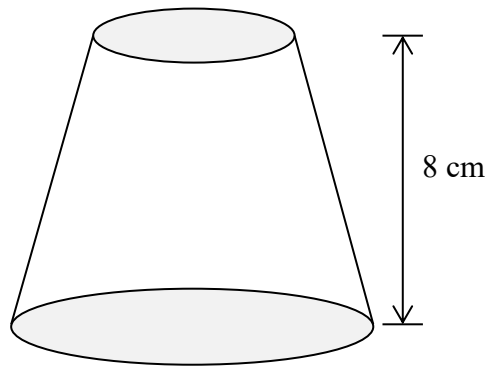


Figure 3

- (a) Find the radius of the upper surface. (3 marks)
- (b) Someone claims that the curved surface area of the frustum is larger than $250\pi \text{ cm}^2$. Do you agree? Explain your answer. (4 marks)

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

A large rectangular area with horizontal lines for writing. The lines are evenly spaced and cover most of the page. A faint watermark 'BM Tutorial Centre' is visible diagonally across the page.

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

The image shows a large rectangular area with horizontal lines, intended for writing answers. A faint watermark 'BM Tutorial Centre' is visible across the center of this area. The lines are evenly spaced and extend across the width of the page.

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

A large rectangular area with horizontal lines for writing answers. The lines are evenly spaced and cover most of the page. A faint watermark 'BM Tutorial Centre' is visible diagonally across the page.

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

A large rectangular area with horizontal lines for writing. The lines are evenly spaced and cover most of the page. A faint watermark 'BM Tutorial Centre' is visible diagonally across the page.

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

The central part of the page is a large rectangular area enclosed by a thin black border. It contains 25 horizontal lines, providing space for writing answers. A large, faint watermark with the text 'BM Tutorial Centre' is oriented diagonally across the entire page, passing through this writing area.

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

A large rectangular area with horizontal lines for writing. The lines are evenly spaced and cover most of the page. A faint watermark 'BM Tutorial Centre' is visible diagonally across the page.

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

