

MATHEMATICS PAPER 2 - 2019 LANJET JOINT MOCK EXAMINATION

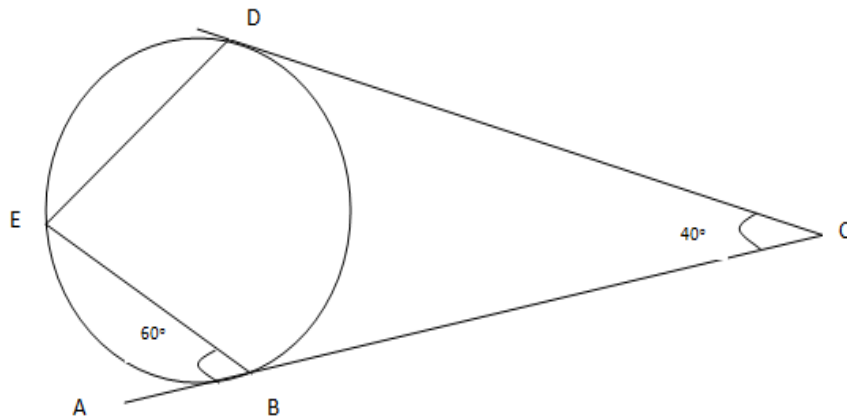
SECTION 1 (50 MARKS)

Attempt all questions in this section.

- Find the percentage error in calculating the volume of the cuboid whose dimensions are 8.2cm by 6.2cm by 5.7cm (3mks)
- Using the mid-ordinate rule of 5 strips, determine the area under the curve $y = 3x^2 + 10$. The lines $x = 1$, $x = 6$ and x-axis. (3 mks)
- $OA = 2i + 3j + 4k$ while $OB = 5i + 9j - 2k$. P divides AP externally in the ratio 2:1. Find the coordinates of P. (3 mks)
- Use mathematical tables to evaluate: (4mks)

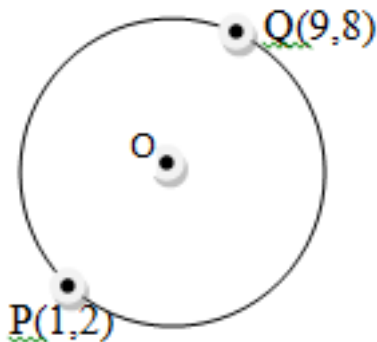
$$3\sqrt{\frac{0.8423 \times 72.5}{930.5}}$$

- On the figure below, line ABC and DC are tangents of the circle at B and D respectively.



Calculate

- $\angle CBD$
 - $\angle CDE$
- Without using a calculator evaluate; (3mks)
 $(\log_2 x)^2 + \log_2 8 = \log_2 x^4$
 - P and Q are the points on the ends of the diameter of the circle below.



MARKING SCHEME

1. Find the percentage error in calculating the volume of the cuboid whose dimensions are 8.2cm by 6.2cm by 5.7cm (3mks)

$R.E = \frac{0.05}{8.2} + \frac{0.05}{6.2} + \frac{0.05}{5.7}$ $= 0.02293$	M1	- represent
$P.E = 0.02293 \times 100$	M1	- or equivalent
$= 2.293$	$\frac{A1}{3}$	- C.A.O

2. Using the mid-ordinate rule of 5 strips, determine the area under the curve $y = 3x^2 + 10$. The lines $x = 1$, $x = 6$ and x-axis. (3 mks)

<table border="1"> <tr> <td>X</td> <td>1.5</td> <td>2.5</td> <td>3.5</td> <td>4.5</td> <td>5.5</td> </tr> <tr> <td>Y=3X²+10</td> <td>16.75</td> <td>28.75</td> <td>46.75</td> <td>70.75</td> <td>100.75</td> </tr> </table>	X	1.5	2.5	3.5	4.5	5.5	Y=3X ² +10	16.75	28.75	46.75	70.75	100.75	B1	Completion of table
X	1.5	2.5	3.5	4.5	5.5									
Y=3X ² +10	16.75	28.75	46.75	70.75	100.75									
$\text{Area} = (16.75 + 28.75 + 46.75 + 70.75 + 100.75)$ $= 263 \text{ (square units)}$	M1	- Working												
	$\frac{A1}{3}$	- C.A.O.												

3. $OA = 2i + 3j + 4k$ while $OB = 5i + 9j - 2k$. P divides AP externally in the ratio 2:1. Find the coordinates of P. (3 mks)

$OP = - \begin{pmatrix} 2 \\ 13 \\ 4 \end{pmatrix} + 2 \begin{pmatrix} 5 \\ 9 \\ -2 \end{pmatrix}$	M1	or equivalent
$= \begin{pmatrix} -2 \\ -3 \\ -4 \end{pmatrix} + \begin{pmatrix} 10 \\ 18 \\ -4 \end{pmatrix}$	A1	- Column vector
$= \begin{pmatrix} 8 \\ 15 \\ -8 \end{pmatrix}$	B1	- Coordinates
$\therefore P (8, 15, -8)$		

4. Use mathematical tables to evaluate:

(4mks)

$$3\sqrt{\frac{0.8423 \times 72.5}{930.5}}$$