JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. Tulis nama dan kelas anda pada ruang yang disediakan.

2. Kertas soalan ini adalah dalam Bahasa Inggeris sepenuhnya.

3. Calon dikehendaki membaca arahan di halaman 2.

<table>
<thead>
<tr>
<th>Kod Pemeriksa</th>
<th>Bahagian</th>
<th>Soalan</th>
<th>Markah Penuh</th>
<th>Markah Diperoleh</th>
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<td>16</td>
<td>12</td>
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<tr>
<td></td>
<td>Jumlah</td>
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</tbody>
</table>

Kertas ini mengandungi 27 halaman bercetak dan 2 halaman tidak bercetak.

[ Lihat sebelah ]

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INFORMATION FOR CANDIDATES

1. This question paper consists of two sections: Section A and section B.

2. Answer all questions in Section A and four questions from Section B.

3. Write your answers clearly in the spaces provided in the question paper.

4. Show your working. It may help you to get marks.

5. If you wish to change your answer, neatly cross out the answer that you have done. Then write down the new answer.

6. The diagrams in the questions provided are not drawn to scale unless stated.

7. The marks allocated for each question and sub-part of a question are shown in brackets.

8. A list of formulae is provided on pages 3 to 4.

9. A booklet of four-figure mathematical tables is provided.

10. You may use a non-programmable scientific calculator.

11. This question paper must be handed in at the end of the examination.
MATHEMATICAL FORMULAE

The following formulae may be helpful in answering the questions. The symbols given are the ones commonly used.

**RELATIONS**

1. $a^m \times a^n = a^{m+n}$
2. $a^m \div a^n = a^{m-n}$
3. $(a^m)^n = a^{mn}$
4. $A^{-1} = \frac{1}{ad-bc} \begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$
5. $P(A) = \frac{n(A)}{n(S)}$
6. $P(A') = 1 - P(A)$
7. Distance $= \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$
8. Midpoint, $(x, y) = \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$
9. Average speed $= \frac{\text{distance travelled}}{\text{time taken}}$
10. Mean $= \frac{\text{sum of data}}{\text{number of data}}$
11. Mean $= \frac{\text{Sum of (class mark} \times \text{frequency)}}{\text{Sum of frequencies}}$
12. Pythagoras Theorem $c^2 = a^2 + b^2$
13. $m = \frac{y_2 - y_1}{x_2 - x_1}$
14. $m = -\frac{y\text{-intercept}}{x\text{-intercept}}$
SHAPES AND SPACE

1. Area of trapezium = \( \frac{1}{2} \times \text{sum of parallel sides} \times \text{height} \)

2. Circumference of circle = \( \pi d = 2\pi r \)

3. Area of circle = \( \pi r^2 \)

4. Curved surface of cylinder = \( 2\pi rh \)

5. Surface area of sphere = \( 4\pi r^2 \)

6. Volume of right prism = cross sectional area \( \times \) length

7. Volume of cylinder = \( \pi r^2 h \)

8. Volume of cone = \( \frac{1}{3} \pi r^2 h \)

9. Volume of sphere = \( \frac{4}{3} \pi r^3 \)

10. Volume of right pyramid = \( \frac{1}{3} \times \text{base area} \times \text{height} \)

11. Sum of interior angles of a polygon = \( (n-2) \times 180^\circ \)

12. \[
\frac{\text{arc length}}{\text{circumference of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}
\]

13. \[
\frac{\text{area of sector}}{\text{area of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}
\]

14. Scale factor, \( k = \frac{PA'}{PA} \)

15. Area of image = \( k^2 \times \text{area of object} \)

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1 The Venn diagrams show set P, Q and R such that the universal set, 
\( \xi = P \cup Q \cup R \).

On the diagrams, shade the region represented by
(a) \( P' \cap R' \)
(b) \( Q' \cap (Q \cap R') \)  

Answer:

(a) 

(b) 

\[ \text{http://tutormansor.wordpress.com/} \]
Diagram 1 shows a cuboid with $ABCD$ as the base on the horizontal plane. $P, Q, R$ and $S$ are the midpoints of the respective sides.

Identify and calculate the angle between the line $PC$ and the plane $CDEH$. 

[4 marks]

Answer:
3. Solve the equation \[ \frac{p(2p + 5)}{2p + 1} = 3. \]

Answer:

4. Solve the following simultaneous linear equations:

\[ \begin{align*} 
3x + 2y &= 8 \\
2x - 3y &= 1 
\end{align*} \]

Answer:
5 In Diagram 2, PQRS is a parallelogram. The equation of the straight line SR is $5y - 3x = 25$.

**Diagram 2**

Find

(a) the equation of the straight line PQ.

(b) the y-intercept of the straight line QR.

**Answer:**

(a) 

(b)
Diagram 3 shows a solid formed by joining a right pyramid and a cube. The volume of the solid is $441 \text{ cm}^3$. Calculate the height, in cm, of the pyramid.

Answer:
Diagram 4 shows a semicircle \( PSTQ \) and sector \( ROU \) with a common \( O \). \( POQR \) is a straight line.

Given \( OQ = 7 \) cm, \( OR = 2OQ \) and \( \angle ROU = \angle POS = 45^\circ \).

Using \( \pi = \frac{22}{7} \), calculate,

(a) the perimeter, in cm, of the whole diagram,
(b) the area, in \( \text{cm}^2 \), of the shaded region.

[ 7 marks ]

Answer :

(a)

(b)
(a) Determine if the following sentence is a statement or non statement.

“3 \times 5 > 8 \times 2“

(b) Write two implications from the following sentence:

“6x - 7 = 17 if and only if \(x = 4\)"

Implication 1: ...........................................................
...........................................................

Implication 2: ...........................................................
...........................................................

(c) Write a conclusion based on the following premises.

Premise 1: If \(3^a \times 3^b = 3^{11}\) then \(a + b = 11\)
Premise 2: \(a + b \neq 11\)
Conclusion: ...........................................................
...........................................................

[4 marks]
Table 1 shows the number of blue, yellow, and red balls in two bags X and Y.

<table>
<thead>
<tr>
<th>Bag Ball</th>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Yellow</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Red</td>
<td>4</td>
<td>7</td>
</tr>
</tbody>
</table>

TABLE 1

Noor Hayati chooses a ball at random.

Calculate the probability that Noor Hayati chooses

a) a blue ball,

b) a yellow ball or a red ball,

c) a blue ball from bag X and a red ball from bag Y.

[5 marks]

Answer:

(a)

(b)

(c)
Diagram 5 shows the distance-time graph of a lorry.

The lorry travels to town Y from town X. After resting for 5 minutes at town Y, it travels to town Z.

(a) Find the distance, in km, from town Y to town Z.
(b) Calculate the speed of the lorry, in kmh$^{-1}$, from town X to town Y.
(c) Calculate the value of $t$, if the speed of the lorry from town Y to town Z is 75 kmh$^{-1}$.

[5 marks]

Answer:

(a) 

(b) 

(c)
(a) The inverse of the matrix \( \begin{pmatrix} 4 & -1 \\ 3 & 2 \end{pmatrix} \) is \( \begin{pmatrix} 2 & 1 \\ k & m \end{pmatrix} \). Find the value of \( k \) and \( m \).

(b) Using matrices, calculate the value of \( x \) and of \( y \) that satisfy the following matrix equation:

\[
\begin{align*}
4x - y &= 6 \\
3x + 2y &= 10
\end{align*}
\]

Answer:

(a) 

(b)
Section B
[ 48 marks ]
Answer any four questions from the section.

12 (a) Complete the table below for the equation \( y = \frac{12}{x} \). [ 2 marks ]

<table>
<thead>
<tr>
<th>( x )</th>
<th>-6</th>
<th>-4</th>
<th>-2</th>
<th>-1</th>
<th>1</th>
<th>2</th>
<th>4</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td>-2</td>
<td>-6</td>
<td>-12</td>
<td>6</td>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(b) For this part of the question, use the graph paper provided. You may use a flexible curve ruler.
By using a scale of 2 cm to 2 units on the \( x \)-axis and 2 cm to 4 units on the \( y \)-axis, draw the graph of \( y = \frac{12}{x} \) for \(-6 \leq x \leq 6\). [ 4 marks ]

(c) From your graph, find

(i) the value of \( y \) when \( x = 3 \).

(ii) the value of \( x \) when \( y = -5 \). [ 2 marks ]

(d) Draw a suitable straight line on your graph to find all the values of \( x \) which satisfy the equation \( \frac{3}{x} = -1 + x \) for \(-6 \leq x \leq 6\). State the values of \( x \). [ 4 marks ]
Answer:

(a) 

<table>
<thead>
<tr>
<th>x</th>
<th>-4</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(b) Refer to the graph paper.

(c) (i) $y = \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots$

(ii) $x = \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots$

(d) $x = \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots$
Graph for Question 12
13 (a) Transformation T represents a translation \( \begin{pmatrix} 3 \\ -3 \end{pmatrix} \) and transformation S represents a reflection in the line \( y = 1 \). State the coordinates of the image of point \((-2, 4)\) under the following transformations:

(i) S
(ii) TT
(iii) ST [5 marks]

b) Diagram 6 shows quadrilaterals \( OABH, OHCD \) and \( OEFG \) drawn on square grids.

\[ \text{DIAGRAM 6} \]

i) Given that transformation V is a reflection in the line \( OHG \) and transformation W is a reflection in the line \( ODE \). If \( OABH \) experiences the transformation of \( WV \), describe in full, a single transformation which is equivalent to transformation \( WV \).

ii) Given that \( OEFG \) is the image of \( ODCH \) under a transformation M.
   (a) Describe in full, transformation M.
   (b) Find the area of the shaded region if the area of \( ODCH \) is 11.8 cm\(^2\). [7 marks]
The data in Diagram 7 shows the masses, in kg, of 40 students in Form 5 A.

<table>
<thead>
<tr>
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<th>64</th>
<th>53</th>
<th>44</th>
<th>65</th>
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<td>56</td>
<td>57</td>
<td>58</td>
<td>63</td>
<td>72</td>
<td>59</td>
<td>52</td>
<td>68</td>
</tr>
</tbody>
</table>

**DIAGRAM 7**

(a) Based on the data in Diagram 7 and by using a class interval of 5 kg, complete Table 3.

(b) State the modal class and calculate the mean mass of the students.

(c) For this part of question, use the graph paper provided.

By using the scale of 2 cm to 5 kg on the $x$-axis and 2 cm to 1 student on the $y$-axis, draw a frequency polygon based on Table 3 constructed in (a).

**Answer:**

<table>
<thead>
<tr>
<th>Mass (kg)</th>
<th>Frequency</th>
<th>Midpoint</th>
</tr>
</thead>
<tbody>
<tr>
<td>35 – 39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 – 44</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TABLE 3**

(b)

(c) Refer to the graph drawn.
Answer:

a) i) ……………………………………………………………………………………………..

ii) ……………………………………………………………………………………………..

iii) ……………………………………………………………………………………………..

b) i) ……………………………………………………………………………………………..

ii) a) ……………………………………………………………………………………………..

b)
Graph for Question 14
You are not allowed to use graph paper to answer this question.

(a) Diagram 8(i) shows a solid prism with a rectangular base $ABCD$ on a horizontal table. The surface $ABTQP$ is the uniform cross-section of the prism. Rectangle $PQRS$ is horizontal plane and rectangle $QTUR$ is an inclined plane. $PA$ and $TB$ are vertical edges.

Draw to full scale, the elevation of the solid on a vertical plane parallel to $BC$ as viewed from $x$.

[3 marks]

Answer:

a)
(b) A solid pyramid with triangular base $BTQ$ is removed from the solid in Diagram 8(i). The remaining solid is as shown in Diagram 8(ii)

**DIAGRAM 8(ii)**

Draw to full scale,

(i) the plan of the remaining solid, [4 marks]

(ii) the elevation of the remaining solid on a vertical plane parallel to $AB$ as viewed from $Y$. [5 marks]
Answer:

(b)(i)

(ii)
16. \( A(30^\circ \text{ N}, 65^\circ \text{ W}), B(30^\circ \text{ N}, 55^\circ \text{ E}), C \) and \( D \) are four points on the surface of the earth. \( AC \) is a diameter of the earth and \( D \) is located at the distance of 4 500 nautical miles due north of \( C \).

(a) State the position of \( C \). 

(b) Find the latitude of \( D \). 

(c) Calculate the distance of \( B \) from \( A \) along a parallel of latitude. 

(d) A plane took off from \( A \) and flew due north via the North Pole to \( D \) at a speed of 700 knots. Find the total times taken for the whole flight. 

Answer:

(a)
b)
c)
(d)

END OF QUESTION PAPER
## Zone A SPM Mock Exam 2008
### Marking Scheme
#### Paper 2

## SECTION A

<table>
<thead>
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<th>No.</th>
<th>Solution</th>
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<tbody>
<tr>
<td>1</td>
<td><img src="image1.png" alt="Diagram" /></td>
</tr>
</tbody>
</table>

### (a)

\[
\begin{align*}
  & (a) \\
  & (b)
\end{align*}
\]

### (b)

\[
\begin{align*}
  & (b) \\
  & (b)
\end{align*}
\]

### No. Solution Marks

<p>| | | |</p>
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</thead>
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<td>N1</td>
</tr>
<tr>
<td></td>
<td>(b)</td>
<td>N2</td>
</tr>
</tbody>
</table>

### 2

\[
\begin{align*}
  & p(2p + 5) = 3(2p + 1) \\
  & 2p^2 + 5p = 6p + 3 \\
  & 2p^2 + 5p - 6p - 3 = 0 \\
  & 2p^2 - p - 3 = 0 \\
  & (2p - 3)(p + 1) = 0 \\
  & 2p - 3 = 0 \text{ or } p + 1 = 0 \\
  & 2p = 3 \quad p = -1 \\
  & p = \frac{3}{2}
\end{align*}
\]

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3

\[ \begin{align*} 
3x + 2y &= 8 \quad \text{(1)} \\
2x - 3y &= 1 \quad \text{(2)} \\
(1) \times 2 &\Rightarrow 6x + 4y = 16 \quad \text{(3)} \\
(2) \times 3 &\Rightarrow 6x - 9y = 3 \quad \text{(4)} \\
(3) - (4) &\Rightarrow 4y - (-9y) = 16 - 3 \\
13y &= 13 \\
y &= \frac{13}{13} = 1 \\
\text{Substitute } y = 1 \text{ into (1),} \\
3x + 2(1) &= 8 \quad \text{K1} \\
3x + 2 &= 8 \\
3x &= 8 - 2 \\
x &= \frac{6}{3} = 2 \\
\text{Thus, } x = 2, \ y = 1.
\end{align*} \]

\textbf{Remark:}

Accept any sufficient methods.

4

Angle between PC and plane CDEF is \( \angle PCS \)

\[ \tan \angle PCS = \frac{10}{\sqrt{73}} \quad \text{K1, K1} \]

\( \angle PCS = 49^\circ 29' \)
5

(a) \( 5y - 3x = 25 \)

\[ 5y = 25 + 3x \]

\[ y = \frac{3}{5}x + \frac{5}{3} \]

Line \( SR \) is parallel with line \( PQ \).

Therefore, \( m_{SR} = m_{PO} = \frac{3}{5} \)

\[ y = \frac{3}{5}x + c \]

Substitute \( P (-5, -1) \) into the equation

\[ -1 = \frac{3}{5}(-5) + c \]

\[ -1 = -3 + c \]

\[ c = 2 \]

Therefore, the equation of the straight line \( PQ \) is \( y = \frac{3}{5}x + 2 \).

b) \( S = (0, 5) \), \( P = (-5, -1) \)

\[ m_{QR} = m_{PS} \]

\[ = \frac{-1 - 5}{-5 - 0} = \frac{-6}{-5} = \frac{6}{5} \]

Therefore, \( y = \frac{6}{5}x + c \), substitute \( R(10, 11) \) into the equation

\[ 11 = \frac{6}{5}(10) + c \]

\[ 11 = 12 + c \]

\[ c = -1 \]

Therefore, the \( y \)-intercept of the straight line \( QR \) is \(-1\).
6.

Volume of the cube = $7^3$

$= 343 \text{ cm}^3$

Volume of the pyramid = $441 - 343$

$= 98 \text{ cm}^3$

$\frac{1}{3} \times 7 \times 7 \times h = 98$

$h = \frac{98 \times 3}{49}$

$h = 6$

The height of the pyramid is 6 cm.

7.

a) Length of arc PST = $\frac{135}{360} \times 2 \times \frac{\text{22}}{\text{7}} \times 7 = 16.5 \text{ cm}$

Length of arc UR = $\frac{45}{360} \times 2 \times \frac{\text{22}}{\text{7}} \times 14 = 11 \text{ cm}$

Length of TU = 7 cm

Length of POQR = 21 cm

Perimeter of whole diagram

$= 16.5 + 11 + 7 + 21 = 55.5 \text{ cm.}$

b) Area of shaded region =

Area of shaded sector SOT = $\frac{90}{360} \times \frac{\text{22}}{\text{7}} \times 7 \times 7 = 38.5 \text{ cm}^2$

Area of sector ROU = $\frac{45}{360} \times \frac{\text{22}}{\text{7}} \times 14 \times 14 = 77 \text{ cm}^2$

Area of sector TOQ = $\frac{45}{360} \times \frac{\text{22}}{\text{7}} \times 7 \times 7 = 19.25 \text{ cm}^2$

Therefore, area of shaded region

$= \text{SOT} + \text{ROU} \text{ – TOQ}$

$= 38.5 + 77 - 19.25 = 96.25 \text{ cm}^2$
8 a) Statement.  
   b) Implication 1: If $6x - 7 = 17$, then $x = 4$  
   Implication 2: If $x = 4$, then $6x - 7 = 17$.  
   c. Conclusion: $3^a \times 3^b \neq 3^{11}$

9 a) $\frac{7}{25}$
   b) $\frac{7}{25} + \frac{11}{25} = \frac{18}{25}$
   c) $\frac{2}{10} \times \frac{7}{15} = \frac{7}{75}$

10 a) $25 - 10 = 15$ km
   b) speed $= \frac{(10 - 0) km}{(10 - 0) min}$
      $= \frac{10 km}{10 \times \frac{1}{60} h}$
      $= 60 \text{ km/h}$
      $= 60 \text{ kmh}^{-1}$
   c) $\frac{75 \text{ km}}{h} = \frac{(25 - 10) \text{ km}}{(t - 15) \text{ min}}$
      $\frac{75 \text{ km}}{60 \text{ min}} = \frac{10 \text{ km}}{(t - 15) \text{ min}}$
      $t - 15 = \frac{10}{75} \times 60$
      $t = 12 + 15$
      $t = 27 \text{ min}$

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11 (a) 
\[
\frac{1}{(4)(2)} - \frac{1}{(3)(3)} = \left( \begin{array}{cc} 2 & 1 \\ -3 & 4 \end{array} \right) = \frac{1}{8 + 3} \left( \begin{array}{cc} 2 & 1 \\ -3 & 4 \end{array} \right) = \frac{1}{11} \left( \begin{array}{cc} 2 & 1 \\ -3 & 4 \end{array} \right)
\]
\[\therefore k = 11, m = -3\]

(b) 
\[
\left( \begin{array}{cc} 4 & -1 \\ 3 & 2 \end{array} \right) \left( \begin{array}{c} x \\ y \end{array} \right) = \left( \begin{array}{c} 6 \\ 10 \end{array} \right)
\]
\[
\left( \begin{array}{c} x \\ y \end{array} \right) = \frac{1}{11} \left( \begin{array}{cc} 2 & 1 \\ -3 & 4 \end{array} \right) \left( \begin{array}{c} 6 \\ 10 \end{array} \right) = \frac{1}{11} \left( \begin{array}{c} 2(6) + 1(10) \\ -3(6) + 4(10) \end{array} \right)
\]
\[
\left( \begin{array}{c} x \\ y \end{array} \right) = \frac{1}{11} \left( \begin{array}{c} 12 + 10 \\ -18 + 40 \end{array} \right) = \frac{1}{11} \left( \begin{array}{c} 22 \\ 22 \end{array} \right) = \left( \begin{array}{c} 2 \\ 2 \end{array} \right)
\]
\[x = 2, \ y = 2\]

** Note if \( \left( \begin{array}{c} x \\ y \end{array} \right) = \left( \begin{array}{c} 2 \\ 2 \end{array} \right) \) only, then N1

Don’t accept if using simultaneous linear equation.
12

(a) Refer to the graph drawn by the student.
Axes labeled with the correct scale.

<table>
<thead>
<tr>
<th>x</th>
<th>-6</th>
<th>-4</th>
<th>-2</th>
<th>-1</th>
<th>1</th>
<th>2</th>
<th>4</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>-2</td>
<td>-3</td>
<td>-6</td>
<td>-12</td>
<td>12</td>
<td>6</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

(b) 8 points plotted correctly.
**Note:** If 7 points plotted correctly – give P1

A smooth graph is drawn.
### (c) (i) \( y = 4 \)  
\( x = -2.4 \)  
(iii) \( x = -1.35 \leq x \leq -1.25 \)  
\( 2.25 \leq x \leq 2.35 \)  

### (d) Linear equation, \( y = 4x - 4 \)  
Graph drawn correctly.  
\( x = -1.35 \leq x \leq -1.25 \)  
\( 2.25 \leq x \leq 2.35 \)

| 13 | a) i) \((-2, -2)\)  
ii) \((1, 3)\)  
\[= (4, -2)\]  
iii) \((1, 3)\)  
\[= (1, 1)\]  
<table>
<thead>
<tr>
<th></th>
<th>N1</th>
</tr>
</thead>
<tbody>
<tr>
<td>b) i) Rotation of 90° clockwise about point O.</td>
<td>N1,N1,N1</td>
</tr>
<tr>
<td>ii) a) M is an enlargement at centre O with a scale factor of 3.</td>
<td>N1,N1,N1</td>
</tr>
</tbody>
</table>
| b) Image = \( k^2 \times \text{object} \)  
\[= 3^2 \times 11.8 \]  
\[= 106.2 \text{ cm}^2 \] | K1 |

Area of the shaded region  
\[= 106.2 - 11.8 \]  
\[= 94.4 \text{ cm}^2 \]  
N1  
12
a) Class interval : all correct
Frequency : all correct
Midpoint : all correct
\(fx\) : all correct

<table>
<thead>
<tr>
<th>Mass (Kg)</th>
<th>Frequency</th>
<th>Midpoint</th>
</tr>
</thead>
<tbody>
<tr>
<td>35 – 39</td>
<td>0</td>
<td>37</td>
</tr>
<tr>
<td>40 – 44</td>
<td>2</td>
<td>42</td>
</tr>
<tr>
<td>45 – 49</td>
<td>6</td>
<td>47</td>
</tr>
<tr>
<td>50 – 54</td>
<td>7</td>
<td>52</td>
</tr>
<tr>
<td>55 – 59</td>
<td>10</td>
<td>57</td>
</tr>
<tr>
<td>60 – 64</td>
<td>8</td>
<td>62</td>
</tr>
<tr>
<td>65 – 69</td>
<td>4</td>
<td>67</td>
</tr>
<tr>
<td>70 – 74</td>
<td>3</td>
<td>72</td>
</tr>
<tr>
<td>75 – 79</td>
<td>0</td>
<td>77</td>
</tr>
</tbody>
</table>

Class interval : all correct
Frequency : all correct
Midpoint : all correct
\(fx\) : all correct

b) Modal class = 55 – 59

<table>
<thead>
<tr>
<th>Midpoint, x</th>
<th>Frequency , f</th>
<th>fx</th>
</tr>
</thead>
<tbody>
<tr>
<td>42</td>
<td>2</td>
<td>84</td>
</tr>
<tr>
<td>47</td>
<td>6</td>
<td>282</td>
</tr>
<tr>
<td>52</td>
<td>7</td>
<td>364</td>
</tr>
<tr>
<td>57</td>
<td>10</td>
<td>570</td>
</tr>
<tr>
<td>62</td>
<td>8</td>
<td>496</td>
</tr>
<tr>
<td>67</td>
<td>4</td>
<td>268</td>
</tr>
<tr>
<td>72</td>
<td>3</td>
<td>216</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>2280</td>
</tr>
</tbody>
</table>

Mean mass = \(\frac{2280}{40} = 57\) kg

\[http://tutormansor.wordpress.com/\]
c) Refer to the graph drawn by the student.
Axes labeled with the correct scale.
7 points plotted correctly.
Noted: If 6 points plotted correctly – give P1
Joint all points.
Shape looks correct with two rectangles QTBCUR, all solid lines.

QT = RU = 2 cm, UC = TB = 4 cm.

Note: If TU drawn in dashed line --- minus 1 mark.

Correct measurement to $\pm 0.2\,\text{cm}$ (one way)

Right – angles of the rectangle = $90^\circ \pm 1^\circ$. 
Shapes looks correct with two rectangles PQRS and RQBU respectively. All joint with a solid lines.
SR = PQ = 1 cm, SP = RQ = 8 cm
Correct measurements to $\pm 0.2\, \text{cm}$ (one way)
Right – angles of the rectangle = $90^0 \pm 1^0$. 

http://tutormansor.wordpress.com/
Shape looks correct with trapezium ABUP and a triangle QBU. All joints with a solid line.

Q and B joined with solid line to form triangle QUB.

PQ = 1 cm, PA = 6 cm
AB = 4 cm, UC = 4 cm

Correct measurement to ± 0.2 cm (one way)

Right – angles of the rectangle = 90° ± 1°.
a) Longitude of \( C = (180^\circ - 65^\circ) \) E
\[ = 115^\circ \text{ E} \]
Latitude of \( C = 30^\circ \text{ S} \)

Therefore, \( C \) is \((30^\circ \text{ S}, 115^\circ \text{ E})\).

b) \( \angle DOC = \frac{4500}{60} = 75^\circ \)
Latitude of \( D = (75^\circ - 30^\circ) \text{ N} \)
\[ = 45^\circ \text{ N}. \]

c) \((65 + 55) \times 60 \times \cos 30^\circ\)
\[ = 6235.4 \text{ nautical miles}. \]
d) Distance from A to D

\[
\begin{align*}
&= (180 - 30 - 45) \times 60 = 6300 \text{ nautical miles.} \\
&= 700 \text{ knots} = 700 \text{ n.m} = 1 \text{ hour} \\
\end{align*}
\]

Therefore, \( \frac{6300}{700} = 9 \) hours.