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# SOLUTIONS TO WORKING WITH NUMBERS

## Question 1 (Adapted from Nov 2011, Paper 1, Question 1)

<table>
<thead>
<tr>
<th>Ques</th>
<th>Solution</th>
<th>Explanation</th>
</tr>
</thead>
</table>
| 1.1.1 | \(241.50(124.37 - 121.79) + \sqrt{232.5625}\)  
= 523.07 + 15.25 ✅ A  
= 538.32 ✅ CA | 1A simplifying both terms  
1CA simplification  
Answer only full marks (2) |
| 1.1.2 | 25.5 ÷ 100 ✅ M  
= 0.255 m ✅ A | 1M dividing by 100  
1A simplification  
Answer only full marks (If 0.26 penalize 1 mark) (2) |
| 1.1.3 | \(\frac{21}{2} \times 12\) ✅ M  
= 30 eggs ✅ CA  
OR  
12 + 12 + 6 ✅ M  
= 30 eggs ✅ CA | 1M concept of dozen  
1CA simplification  
Answer only full marks (2) |
| 1.1.4 | 01:04 ✅ A  
OR 1:04 am  
OR 4 min after 1 in the morning | 2A answer (2) |
| 1.1.5 | \(36 \div 4 = 9\) ✅ A | 1M dividing  
1A answer  
Answer only full marks (2) |
| 1.1.6 | 1 OR 100% OR certain OR definite ✅ A | 2A answer (2) |
Question 2 (Adapted from Feb/Mar 2011, Paper 2, Question 1.1)

<table>
<thead>
<tr>
<th>Ques</th>
<th>Solution</th>
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</tr>
</thead>
</table>
| 2.1(a) | $\sqrt{M}$  
\[ A = 100\% - (15.6 + 27.2 + 22.4 + 7.2 + 2.3 + 6.0 + 4.4)\% 
= 14.8\% \sqrt{CA} \] | 1M subtracting from 100%  
1CA value of $A$ |
| 2.1(b) | Total number of learners = $\frac{195}{15.6\%}$  
\[ = 1250 \sqrt{A} \]  
\[ \frac{B}{1250} \times 100\% = 4.4\% \sqrt{M} \]  
\[ B = \frac{4.4\% \times 1250}{100\%} \]  
\[ = 55 \sqrt{CA} \] | 1A number of learners  
1M using 4.8%  
1CA value of $B$ |

<table>
<thead>
<tr>
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</tr>
</thead>
</table>
| 2.2 | Percentage = $7.2\% + 2.4\% + 6\% + 4.4\% \sqrt{M}$  
\[ = 20\% \sqrt{CA} \]  
OR  
Percentage = $\frac{90 + 30 + 75 + 55}{1250} \times 100\% \sqrt{M}$  
\[ = \frac{250}{1250} \times 100\% \]  
\[ = 20\% \sqrt{CA} \] | 1M adding  
1CA percentage  
1M finding percentage  
1CA percentage |
### Question 3 (Adapted from Nov 2011, Paper 1, Question 2.2)

<table>
<thead>
<tr>
<th>3.1</th>
<th>Northern Cape ✔ RG</th>
<th>1RG answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2</td>
<td>✔ RG Free State and Western Cape ✔ RG</td>
<td>2RG answer</td>
</tr>
<tr>
<td>3.3</td>
<td>✔ ✔ RG Mpumalanga OR Western Cape ✔ ✔ RG</td>
<td>2RG answer (penalty of 1 if one province is wrong)</td>
</tr>
<tr>
<td>3.4</td>
<td>100% - (6.5 + 29.7 + 9.5 + 10.6 + 13.9 + 10.6 + 1.4 + 7.6)% = 10.2% ✔ A</td>
<td>1M concept 1A simplification Answer only full marks</td>
</tr>
<tr>
<td>3.5</td>
<td>( \frac{3249415}{0.065} ) ✔ M OR ( \frac{3249415}{6.5} \times \frac{100}{1} ) ✔ CA</td>
<td>1M concept 1RG correct percentage 1CA simplification (maximum 2 marks if they use land area percentage) Penalty 1 mark if answer is not a whole number Answer only full marks</td>
</tr>
</tbody>
</table>
### Question 4 (Adapted from Nov 2011, Paper 1, Question 6.1)

<table>
<thead>
<tr>
<th>Ques</th>
<th>Solution</th>
<th>Explanation</th>
</tr>
</thead>
</table>
| 4.1  | **P = R4 600 + (R250 × 2)**  \(\checkmark\text{SF}\)  
     | \(= R5 100\  \checkmark\text{A} \)  \(\checkmark\text{SF}\)  
     | \(R6 100 = R4 600 + (R250 × Q)\)  OR  \(R6 400 = R4 000 + (R400 × Q)\)  
     | **Q = 6**  \(\checkmark\text{A}\)  
     | **Q = 5**  \(\checkmark\text{A}\)  | 1SF substitution  
     | 1A answer  | 1SF substitution  
     | 1A simplification  | 1A simplification  | 1A answer  |

Answer only full marks

4.2  
| (a) | **R4 000**  \(\checkmark\text{RT}\) | 1RT answer |
| (b) | **7**  \(\checkmark\checkmark\text{RT}\) | 2RT answer |
| (c) | The team members would earn more money from Option B  \(\checkmark\checkmark\text{A}\) | 2A answer |
### SOLUTIONS TO FINANCE CALCULATIONS

**Question 1** (Adapted from November 2011 P1, Question 1.2.1 -1.2.2)

1.1

\[
20 \times 0.95 \quad \checkmark M
\]

= 19 Botswana pula (BWP) \( \checkmark A \)

**OR**

\[
\text{1 Botswana pula (BWP)} = \frac{1}{0.95} \text{ ZAR}
\]

\[
= 1.0526316 \text{ ZAR} \quad \checkmark M
\]

\[
R20 = \frac{20}{1.0526316} \quad \text{BWP}
\]

\[
= 19 \text{ BWP} \quad \checkmark A
\]

**OR**

\[
2 \times 20 \times 0.95 \quad \checkmark M
\]

= 38 Botswana pula (BWP) \( \checkmark A \)

---

1.2

Total amount due \( \checkmark M/A \)

\[
= (10 \times 360\ 286 \text{ ZMK}) + (8 \times 85\ 134 \text{ ZMK})
\]

\[
- 1\ 021\ 605 \text{ ZMK}
\]

\[
= (3\ 602\ 860 + 681\ 072 - 1\ 021\ 605) \text{ ZMK}
\]

= 3\ 262\ 327 ZMK \( \checkmark CA \)

---

1M multiplying
1A simplification
Answer only full marks

Penalty of 1 mark if answer is in rand.

1M dividing
1A simplification

1M multiplying
1A simplification

1M /A substitution
1CA multiplication
1CA simplification
Answer only full marks
No penalty if answer is given with comma separators for thousands

(2)

(3)
Question 2  (Adapted from November 2011 P1, Question 3.1)

2.1.1

\[
\begin{align*}
\checkmark M & \quad A = R400 - R210 = R190 \quad \checkmark A \\
\checkmark M & \quad B = R25,00 \times 30 = R750 \quad \checkmark CA \\
\checkmark M & \quad C = 4 \times R110 = R440 \quad \checkmark A \\
\checkmark M & \quad D = 4 \times R125 = R500 \quad \checkmark A \\
\end{align*}
\]

1M subtracting  
1A simplification

1M multiplying  
1CA simplification  
(maximum 1 mark if not using 30 days)

1M multiplying  
1A simplification

1M multiplying  
1A simplification

Answer only full marks (8)

2.1.2

\[
\begin{align*}
\checkmark M & \quad R2 500 - R2 330 \\
& = R170 \quad \checkmark CA \\
\end{align*}
\]

1M subtracting  
1CA simplification  
(no penalty if answer is negative)

(2)

2.1.3

Use at least one of her weekend entertainment money allowances  
\checkmark \checkmark A  
2A answer

OR

Reduce food expenses to save R30.  \checkmark \checkmark A

OR

(any other suitable answer)  
(2)
Question 3  (Adapted from November 2011 P1, Question 3.2)

3.1

\[ A = P (1 + i)^n, \]
\[ = R125 \left( 1 + \frac{8}{100} \right)^3 \checkmark M \text{ OR } R125 \left( 1 + 0.08 \right)^3 \]
\[ \approx R157,464 \checkmark CA \]

OR

For a year: \( R125 \times 52 = R6,500 \)

\[ A = P (1 + i)^n, \]
\[ = R6,500 \left( 1 + \frac{8}{100} \right)^3 \checkmark M \]
\[ = R8,188.23 \text{ per annum} \]
\[ = R157,464 \text{ per week} \]
\[ \approx R157.46 \checkmark CA \]

Question 4  (Adapted from November 2011 P2, Question 1)

<table>
<thead>
<tr>
<th>Ques</th>
<th>Solution</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1.1</td>
<td>[ \checkmark A \text{ Salary} = R750 \times \text{number of days worked} ] [ \checkmark A \text{ OR} ] [ \checkmark A \text{ OR} \text{ Salary} = R750 \times n, \text{ where } n \text{ is the number of days worked} ] [ \checkmark A \text{ OR} \text{ Salary} = R750n, \text{ where } n \text{ is the number of days worked} ]</td>
<td>1A R750 1A multiplying by number of working days (Max 1 mark if NOT one term. No penalty if rand symbol left out)</td>
</tr>
</tbody>
</table>
### 4.1.2

**SA Meds graph**

- 1CA (1, 3 500) plotted correctly
- 1CA (2, 4 000) or any other correct point plotted correctly
- 1CA (20, 13 000)
- 1CA joining points

**ABC Cigs graph**

- 1CA (1, 750)
- 1CA (20, 15 000)
- 1CA joining points

**Penalty 1 mark if Y-axis is joined**

(8)

---

### 4.1.3(a)

12 days ✓ RG

2 RG reading from graph plotted

---

### 4.1.3(b)

16 days ✓ RG

OR

\[
\text{Salary (Meds) } = R3 000 + R500 \times 18 = R12 000 \quad \check{M}
\]

\[
\therefore R750 \times \text{number of days worked} = R12 000
\]

Number of days = 16 ✓ A

2 RG reading from graph plotted

1M calculating salary

1A number of days

(2)
### SOLUTIONS TO MAPWORK

**Question 1 (Adapted from Nov 2011, P1, Question 3.3)**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1.1</td>
<td>✓A Row 5 column 2 ✓A</td>
<td>1A row 1A column (2)</td>
</tr>
<tr>
<td>1.2.2</td>
<td>3 ✓CA OR 4 ✓CA</td>
<td>1CA answer (1)</td>
</tr>
<tr>
<td>1.3.3</td>
<td>✓✓A South-east OR North-west OR South-west OR North-east OR To the right at the back OR To the left in front</td>
<td>2A answer (2)</td>
</tr>
<tr>
<td>1.4.4</td>
<td>✓A Total area = 32 × 0.75 m² ✓M = 24 m² ✓CA</td>
<td>1A using correct values 1M multiplying by whole number 1CA simplification from multiplication (3)</td>
</tr>
</tbody>
</table>
### Question 2 (Adapted from Nov 2011, P2, Question 3.1)

2.1.1(a)  
<table>
<thead>
<tr>
<th>4,0 cm ✓✓ A</th>
</tr>
</thead>
</table>

2A measurement  
(Accept from 3,7 cm to 4,3 cm)

Maximum 1 mark if answer in mm (2)

<table>
<thead>
<tr>
<th>2.1.1(b)</th>
<th>✓✓ M 2 cm represent 300 km ✓✓ A</th>
<th>✓✓ M ✓✓ CA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>✓✓ M ✓✓ CA</td>
<td>✓✓ M ✓✓ CA</td>
</tr>
<tr>
<td></td>
<td>✓✓ M 2 cm represent 300 km ✓✓ A</td>
<td>✓✓ M ✓✓ CA</td>
</tr>
<tr>
<td></td>
<td>2 cm represent 30 000 000 cm ✓✓ CA</td>
<td>✓✓ M ✓✓ CA</td>
</tr>
<tr>
<td></td>
<td>: the scale is 1: 15 000 000 ✓✓ CA</td>
<td>✓✓ M ✓✓ CA</td>
</tr>
<tr>
<td></td>
<td>Actual distance = 4,0 cm ( \times ) 15 000 000 ✓✓ M</td>
<td>✓✓ M ✓✓ CA</td>
</tr>
<tr>
<td></td>
<td>= 60 000 000 cm ✓✓ M</td>
<td>✓✓ M ✓✓ CA</td>
</tr>
<tr>
<td></td>
<td>= 600 km ✓✓ C</td>
<td>✓✓ M ✓✓ CA</td>
</tr>
</tbody>
</table>

OR

<table>
<thead>
<tr>
<th>✓✓ M 2 cm represents 300 km ✓✓ A</th>
<th>✓✓ M ✓✓ CA</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,0 cm represents ( \frac{300 \text{ km} \times 4,0 \text{ cm}}{2 \text{ cm}} ) ✓✓ CA</td>
<td>✓✓ M ✓✓ CA</td>
</tr>
<tr>
<td>= 600 km ✓✓ CA</td>
<td>✓✓ M ✓✓ CA</td>
</tr>
</tbody>
</table>

If 1,8 cm = 300 km distance will be 666,67 km, then accept 616,67 km to 716,67 km
2.1.1(b)   

<table>
<thead>
<tr>
<th>M</th>
<th>A</th>
<th>Measure: 100 km</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.8 cm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**There are 5 (0.8 cm) in 4 cm.**

\[ \text{CM} \]

\[ \text{CA} \]

\[ \therefore \text{4.0 cm represent } (100 + 100 + 100 + 100 + 100) \text{ km} = 500 \text{ km} \]

**OR**

\[ \text{CM} \]

\[ \text{CA} \]

\[ 0.8 \text{ cm represent } 100 \text{ km} \]

\[ 0.8 \text{ cm represent } 1000000 \text{ cm} \]

\[ \therefore \text{the scale is } 1:125000000 \]

**Actual distance**

\[ \text{CM} \]

\[ \text{CA} \]

\[ 4.0 \text{ cm} \times 125000000 = 50000000 \text{ cm} \]

\[ = 500 \text{ km} \]

**OR**

\[ \text{CM} \]

\[ \text{CA} \]

\[ 0.8 \text{ cm : 100 km} = \frac{4}{x} \]

\[ x = \frac{100 \text{ km} \times 4 \text{ cm}}{0.8 \text{ cm}} \]

\[ = 500 \text{ km} \]

**Table:**

<table>
<thead>
<tr>
<th>(5)</th>
<th>1M measuring</th>
<th>1A scale</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12.3.3</td>
<td></td>
</tr>
<tr>
<td>1M adding the correct scale values</td>
<td>1A using correct values</td>
<td>1CA simplification</td>
</tr>
<tr>
<td>1M multiplying</td>
<td>1CA conversion</td>
<td></td>
</tr>
<tr>
<td>1A scale</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1CA ratio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1CA solution (Accept 462.5 km to 537.5 km)</td>
<td>(Accept 462.5 km to 537.5 km)</td>
<td></td>
</tr>
</tbody>
</table>
2.1.2  

<table>
<thead>
<tr>
<th>600 km = 110 km/h × Time</th>
<th>12.2.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time = ( \frac{600 \text{ km}}{110 \text{ km/h}} ) ✓M</td>
<td>1M division</td>
</tr>
<tr>
<td>= 5,4545.... hours ✓CA</td>
<td>1CA time taken</td>
</tr>
<tr>
<td>≈ 5,45 hours</td>
<td>(Accept 4,95 to 5,86 and arrival time 13:18 to 14:07)</td>
</tr>
<tr>
<td>Arrival time is 13:42 ✓CA</td>
<td>1CA arrival time</td>
</tr>
<tr>
<td>They will arrive before 14:30 ✓CA</td>
<td>1CA reflection</td>
</tr>
</tbody>
</table>

**OR**

| Time = \( \frac{600 \text{ km}}{110 \text{ km/h}} \) ✓M | 1M division |
| = 5,4545..... hours ✓CA | 1CA solution |
| ≈ 5,45 hours | (Accept 4,95 to 5,86 and arrival time 13:18 to 14:07) |

From 08:15 to 14:30 = 6 h 15 min

| = 6,25 hours ✓CA | 1CA calculating time |
| They will arrive before 14:30 ✓CA | 1CA reflection |

**OR**

| ✓ A | 1A calculating time |
| Time from 08:15 to 14:30 = 6 h 15 min = 6,25 hours | 1M multiplying |

Distance travelled = 110 km/h × Time

| = 110 km/h × 6,25 hours ✓M | 1CA calculating distance |
| = 687,5 km ✓CA | |

This distance is greater than the distance between Pietermaritzburg and Johannesburg.

| They will arrive before 14:30 ✓CA | 1CA reflection |

**OR**

| ✓ A | 1A calculating time |
| Time from 08:15 to 14:30 = 6 h 15 min = 6,25 hours ✓M | 1M dividing |

Required speed = \( \frac{600 \text{ km}}{6,25h} \) = 96 km/h ✓CA

| ✓ CA | 1CA calculating speed |
| He will arrive before 14:30 because he is travelling faster than the required speed. | 1CA reflection |
### 2.1.3(a)

<table>
<thead>
<tr>
<th>Equation</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of fuel bought ( \times ) R10,12 per litre = R 455,40</td>
<td>✓M ✓A</td>
</tr>
<tr>
<td>Amount of fuel bought = ( \frac{R 455,40}{R 10,12 \text{ per litre}} )</td>
<td>✓M ✓A</td>
</tr>
<tr>
<td>= 45 litres ✓CA</td>
<td></td>
</tr>
<tr>
<td>Fuel left in the tank = 60 ℓ – 45 ℓ</td>
<td>✓M</td>
</tr>
<tr>
<td>= 15 ℓ ✓CA</td>
<td></td>
</tr>
<tr>
<td>The gauge was NOT working correctly. ✓CA</td>
<td></td>
</tr>
</tbody>
</table>

**OR**

<table>
<thead>
<tr>
<th>Equation</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tank capacity = 60 ℓ</td>
<td>✓M</td>
</tr>
<tr>
<td>Half-filled tank = 30 ℓ</td>
<td>✓A ✓M ✓A</td>
</tr>
<tr>
<td>Cost to fill half-filled tank = 30 ℓ ( \times ) R10,12 per litre</td>
<td>✓M ✓A</td>
</tr>
<tr>
<td>= R 303,60 ✓CA</td>
<td></td>
</tr>
<tr>
<td>The gauge was NOT working correctly. ✓CA</td>
<td></td>
</tr>
</tbody>
</table>

**OR**

<table>
<thead>
<tr>
<th>Equation</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full tank = 60 ℓ</td>
<td>✓M</td>
</tr>
<tr>
<td>Cost to fill a full tank = 60 ℓ ( \times ) R10,12 per litre</td>
<td>✓M</td>
</tr>
<tr>
<td>= R 607,20 ✓A</td>
<td></td>
</tr>
<tr>
<td>Cost of fuel left in tank before filling = R607,20 – R455,40</td>
<td>✓M ✓CA</td>
</tr>
<tr>
<td>= R151,80 ✓CA</td>
<td></td>
</tr>
<tr>
<td>Petrol in tank before filling = ( \frac{R151,80}{R10,12 \text{ per ℓ}} )</td>
<td>✓M ✓A</td>
</tr>
<tr>
<td>= 15 ℓ ✓CA</td>
<td></td>
</tr>
<tr>
<td>The gauge was NOT working correctly. ✓CA</td>
<td></td>
</tr>
</tbody>
</table>
2.1.3(b) They used \(9 \ell\) to cover 100 km

1 \(\ell\) to cover \(\frac{100}{9}\) km

\(45 \ell\) to cover \(\frac{100}{9} \times 45\) km \(\checkmark M\)

\(-500\) km \(\checkmark CA\)

Distance from Johannesburg = 600 km – 500 km

\(= 100\) km \(\checkmark CA\)

OR

Distance travelled \times petrol consumption

= number of litres used

Distance travelled = \(\frac{45\ell}{9\ell\text{ per}100\text{km}}\) \(\checkmark M\)

\(= 500\) km \(\checkmark CA\)

Distance from Johannesburg = 600 km – 500 km

\(= 100\) km \(\checkmark CA\)

\(\frac{9 \ell \cdot 100\text{ km}}{45 \ell} = x\)

\(x = \frac{45 \ell \times 100\text{ km}}{9 \ell}\)

\(= 500\) km \(\checkmark CA\)

Distance from Johannesburg = 600 km – 500 km

\(= 100\) km \(\checkmark CA\)
### Question 3 (Adapted from Nov 2011, P2, Question 3.2)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• take the N2 to Durban ✓✓✓✓</td>
<td>1A route and town</td>
</tr>
<tr>
<td></td>
<td>• take the N3 to Harrismith ✓✓✓</td>
<td>1A route and town</td>
</tr>
<tr>
<td></td>
<td>• take N5 to Bloemfontein ✓✓✓✓</td>
<td>1A route and town</td>
</tr>
<tr>
<td></td>
<td>• take the N8 through Kimberley ✓✓✓✓</td>
<td>1A route and town</td>
</tr>
<tr>
<td></td>
<td>• take the N10 until Upington ✓✓✓✓</td>
<td>Port Shepstone to East London to Upington N6 N8 N10 (max 4 marks)</td>
</tr>
</tbody>
</table>

*12.3.4

### Question 4 (Adapted from Nov 2011, P2, Question 3.3)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rustenburg ✓✓✓✓</td>
<td>2A destination</td>
</tr>
</tbody>
</table>

*12.3.4

*5* marks

*2* marks
## Question 5 (Adapted from Nov 2011, P2, Question 4.1 - 4.2)

| 5.1 | South ✓A ✓A | 2A direction
|     |             | South West full marks
|     |             | South East 1 mark |
|     |             | (2)             |

| 5.2 | ✓M           | 12.3.1
|     | ▶️M          | 12.3.2
| Area of a window = 160 cm × 130 cm OR 1,6 m × 1,3 m |
|     | = 20 800 cm² | 1M multiplying |
|     | = 2,08 m²   | 1C conversion |
|     | ✓C          | 1M working with percentage |
| Area of a door opening = 109% of 2,08 m² ✓M |
|     | = 1,09 × 2,08 m² |
|     | = 2,2672 m²  ✓CA |
| 2,14 m × width = 2,2672 m² |
| width = 2,2672 m² \[\text{2,14 m}\] |
| = 1,0594... |
| ≈ 1,06 m ✓CA |

1CA width of door opening in metres (5)
SOLUTIONS TO WORKING WITH GRAPHS

Question 1 (Adapted from November 2011 P1, Question 1.3.)
(Need intro to Quest 1.3 and graph and questions from 1.3.2 too but ignore Q 1.3.1 – need to renumber)

Question 2 (Adapted from November 2011 P1, Question 2.1)
(only include 2.1.1 – 2.1.5, also renumber)

2.1

27 °C ✓ RG

1RG answer
No penalty for omitting unit
(1)

2.2

Harare ✓ ✓ RG OR New Delhi ✓ ✓ RG

2RG answer
(maximum 1 mark if two cities given and one is wrong)
(2)

2.3

Amsterdam ✓ RG

1RG answer
(1)

2.4

Harare ✓ ✓ RG

2RG answer
(2)

2.5

8 °C – (–2 °C) ✓ M/A

= 10 °C ✓ CA

OR

✓ M/A

Start at (–2 °C) and count until 8 °C
∴ Range = 10 °C ✓ CA

IM/A concept of range
ICA simplification
Answer only full marks
(2)
Question 3 (Adapted from November 2011 P1, Question 2.3)

3.1

1 hour ✓ ✓ RG

2RG answer
(accept 1:00 or 01:00)

(2)

3.2

✓ ✓ RG

Accept any value more than 3 hours and up to 4 hours

2RG answer

OR

3 < hours ≤ 4  OR  (3 ; 4]

(2)

3.3

R20,00 ✓ ✓ RG

2RG answer

(2)

3.4

R7,00 ✓ ✓ RG

2RG answer

(2)
### Question 4 (Adapted from November 2011 P2, Question 1)

**4.1.1**

<table>
<thead>
<tr>
<th>✓A ✓A</th>
<th>Salary = R750 \times \text{number of days worked}</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓A ✓A</td>
<td>OR</td>
</tr>
<tr>
<td>✓A ✓A</td>
<td>Salary = R750 \times n, where ( n ) is the number of days worked</td>
</tr>
</tbody>
</table>

**1A R750**
1A multiplying by number of working days

(Max 1 mark if NOT one term. No penalty if rand symbol left out)

(2)

**4.1.2**

<table>
<thead>
<tr>
<th>✓A</th>
<th>SALARY FOR POSITIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image.png" alt="Graph" /></td>
</tr>
</tbody>
</table>

SA Meds graph:

1CA (1; 3 500) plotted correctly

1CA (2; 4 000) or any other correct point plotted correctly

1CA (20; 13 000)

1CA joining points

1A correct label for either graph

ABC Cigs graph:

1CA (1; 750)

1CA (20; 15 000)

1CA joining points

Penalty 1 mark if Y-axis is joined

(8)

**4.1.3(a)**

| ✓ ✓RG | 12 days |

2 RG reading from graph plotted

(2)
SOLUTIONS TO DATA HANDLING

Question 1 (Adapted from Nov 2011, P1, Question 4.1)

<table>
<thead>
<tr>
<th>Ques</th>
<th>Solution</th>
<th>Explanation</th>
<th>AS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1.1</td>
<td>6 ✓✓A</td>
<td>2A answer</td>
<td>12.4.3</td>
</tr>
</tbody>
</table>

Question 2 (Adapted from Feb/Mar 2011, P1, Question 1.4)

<table>
<thead>
<tr>
<th>2.1.1</th>
<th>0; 24; 38; 38; 42; 50; 52; 56; 86 ✓✓A</th>
<th>1A answer</th>
<th>12.4.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1.2</td>
<td>38 ✓✓A</td>
<td>1A answer</td>
<td>12.4.3</td>
</tr>
<tr>
<td>-</td>
<td>Mean = ( \frac{52 + 86 + 24 + 38 + 56 + 42 + 0 + 50 + 38}{9} ) ✓✓M</td>
<td>1M finding mean</td>
<td>12.4.3</td>
</tr>
<tr>
<td>-</td>
<td>( = \frac{386}{9} ✓✓A )</td>
<td>1A adding</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>( = 42,888... ✓✓R )</td>
<td>1R rounding</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>( \approx 42,89 ) ✓✓R</td>
<td>Answer only full marks</td>
<td>(3)</td>
</tr>
</tbody>
</table>
Question 3 (Adapted from Nov 2011, P2, Question 5.1)

3.1.2

(a) Vuka Secondary

49; 50; 54; 57; 67; 67; 78; 89; 90; 90; 95; 98 ✓ A

\[ P(\text{Median}) = \frac{67\% + 78\%}{2} \] ✓ M

\[ = 72.5\% \text{ CA} \]

\[ Q(\text{Mean}) \] ✓ M

\[ = \frac{90 + 67 + 67 + 89 + 50 + 78 + 54 + 67 + 95 + 90 + 98 + 57 + 49 + 78}{14} \%
\]

\[ = 73.5\% \text{ CA} \]

Bathini High

\[ R(\text{Range}) = 99\% - 59\% \] ✓ M/A

\[ = 40\% \text{ A} \]
3.1.2
(b) Bathini High performed better✓CA
Bathini High has a greater mean✓J OR Vuka Secondary has a smaller mean
Bathini High a smaller range✓J OR Vuka Secondary has a larger range

3.1.3
(a) The scores are 90%; 95% and 98%✓A

3.1.3
(b) 25th percentile of Bathini High = 67%✓A
∴ 4 learners✓CA

1A identifying score
1CA number of learners
Answer only full marks

1A for 90%
1A for 95%
1A for 98%

Penalty for each extra value. No penalty for extra 90%
4.1.4 (a)

Lindiwe’s score = \((18 \times 2) + (10 \times 1) + (10 \times 3)\) marks
= \((36 + 10 + 30)\) marks
= 76 marks √CA

:: The records were NOT correct √J

OR

√A
Lindiwe lost only \(2 \times 12 = 24\) marks √A
Lindiwe’s score = \((100 - 24)\) marks √M
= 76 marks √CA

:: The records were NOT correct √J

4.1.4 (b)

OPTION 1

30 Multiple choice correct answers = \(30 \times 2\) marks
= 60 marks √A

10 short questions correct = \(10 \times 3 = 30\) marks √A
5 one-word answers correct = \(5 \times 1 = 5\) marks √A

Total marks = 60 + 30 + 5 = 95 √A

OPTION 2

30 Multiple choice correct answers = \(30 \times 2\) marks
= 60 marks √A

9 short questions correct = \(9 \times 3 = 27\) marks √A
8 one-word answers correct = \(8 \times 1 = 8\) marks √A

Total marks = 60 + 27 + 8 = 95 √A

3A correct values
ICA simplification
IJ conclusion

2A calculating
1M subtraction
ICA simplification
IJ conclusion

Maximum 2 marks for correct conclusion with no calculations

(5)

Learners can reason that 5 marks are lost
1M multiplication
1A simplification
1A short questions
1A one-word
1A simplification

Learners can reason that 5 marks are lost
(5)
Question 4 (Adapted from Nov 2011, P2, Question 5.2)

<table>
<thead>
<tr>
<th>4.1</th>
<th>96.67% of the number of learners who passed the examination = 29</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of learners who wrote</td>
</tr>
<tr>
<td></td>
<td>( \frac{29}{96.67%} \times 1 \times 100 \times \sqrt[100]{M} \times \sqrt[100]{A} )</td>
</tr>
<tr>
<td></td>
<td>( \approx 29,999,96555... \approx 30 )</td>
</tr>
<tr>
<td></td>
<td>Number of learners who failed = 30 ( \sqrt[100]{CA} )</td>
</tr>
<tr>
<td></td>
<td>( \sqrt[100]{M} \times \sqrt[100]{A} )</td>
</tr>
<tr>
<td></td>
<td>96.67% : 29 = 3.33%: ( \frac{3.33 \times 29}{96.67} \approx 3.33%: 1 \sqrt[100]{CA} \sqrt[100]{CA} )</td>
</tr>
<tr>
<td></td>
<td>Number of learners who failed = 1</td>
</tr>
<tr>
<td></td>
<td>OR method of trial – and - error</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4.2</th>
<th>Number of learners who passed = 134 ( \sqrt[100]{A} )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( P(\text{degree pass}) = \frac{\text{number of learners with a degree pass}}{\text{total number of learners who passed}} \sqrt[100]{A} \sqrt[100]{M} )</td>
</tr>
<tr>
<td></td>
<td>( = \frac{65}{134} \approx 48.5% \sqrt[100]{CA} )</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4.3</th>
<th>Vuka Secondary performed better. ( \sqrt[100]{A} )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vuka Secondary entered 153 learners for the Matrix examination and more of them obtained a degree pass. (42.48%)</td>
</tr>
<tr>
<td></td>
<td>Vuka Secondary also had more diploma passes (28.8%) ( \sqrt[100]{A} ) OR Bathini High had a higher overall percentage pass rate but they only had 30 learners who wrote the examination and only 13.33% obtained a degree pass.</td>
</tr>
<tr>
<td></td>
<td>OR Any similar well thought-out reasoning. ( \sqrt[100]{A} )</td>
</tr>
</tbody>
</table>
### Question 5 (Adapted from Nov 2011, P1, Question 5.3)

<table>
<thead>
<tr>
<th>5.1</th>
<th>( \frac{13}{50} \checkmark A ) OR 0,26 OR 26 %</th>
<th>1A numerator ( 1)A denominator (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2</td>
<td>( \frac{0}{50} \checkmark A ) OR 0 OR 0 % OR impossible OR none</td>
<td>2A answer (2)</td>
</tr>
</tbody>
</table>

### SOLUTIONS TO PERIMETER AREA & VOLUME

### Question 1 (Adapted from Nov 2011, P1, Question 6.2)

#### 1(a)

Perimeter = \( 2 (98 \text{ m} + 72 \text{ m}) \checkmark M \)

\[
= 340 \text{ m} \checkmark A \checkmark A
\]

1M substitution
1A simplification
1A unit

\underline{Answer only full marks} (3)

#### 1(b)

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

\[
= 3,14 \times (16 \text{ m})^2 \checkmark SF
\]

\[
= 803,84 \text{ m}^2 \checkmark A
\]

Area of semi-circle = \( \frac{803,84 \text{ m}^2}{2} \)

\[
= 401,92 \text{ m}^2 \checkmark CA
\]

OR

Area of semi-circle = \( \frac{1}{2} \pi r^2 \checkmark M \)

\[
= \frac{1}{2} \times 3,14 \times (16 \text{ m}) \checkmark SF
\]

\[
= 401,92 \text{ m}^2 \checkmark CA
\]

\( (\text{using } \pi \ A = 402,12 \text{ m}^2) \)

1A Area of circle
1CA Area semi-circle

\underline{Answer only full marks} (3)
### Question 2 (Adapted from Nov 2011, P1, Question 5.1)

2.1.1 Volume  =  $3.14 \times (18.5 \text{ mm})^2 \times 10 \text{ mm}$  

= 10 746.65 mm³  ✓A ✓A  

(using $\pi : V = 10 752.10 \text{ mm}^3$)

<table>
<thead>
<tr>
<th>1M substitution</th>
<th>1A simplification</th>
<th>1A unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓M</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Answer only full marks

Penalize only once in 5.1.1 or 5.1.2 for unit

12.3.1

2.1.2 Volume  =  $\frac{1}{2} \times 50 \text{ mm} \times 43.3 \text{ mm} \times 10 \text{ mm}$  

= 10 825 mm³  ✓A ✓A

<table>
<thead>
<tr>
<th>1M substitution</th>
<th>1A simplification</th>
<th>1A unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓M</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Answer only full marks

12.3.1

2.1.3 Total surface area of cylinder  

= 2 $\times 3.14 \times 18.5 \text{ mm} \times (18.5 \text{ mm} + 10 \text{ mm})$

= 2 $\times 3.14 \times 18.5 \text{ mm} \times 28.5 \text{ mm}$

= 3 311.13 mm²  ✓A

(using $\pi : \text{TSA} = 3 312.81 \text{ mm}^2$)

<table>
<thead>
<tr>
<th>1SF substitution</th>
<th>1A addition</th>
<th>1CA simplification</th>
<th>1A unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓SF</td>
<td>✓A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Answer only full marks

12.3.1

2.1.4 Total surface area of triangular prism  

= (50 mm $\times 43.3 \text{ mm}) + 3(50 \text{ mm} \times 10 \text{ mm})$

= 2 165 mm² + 1 500 mm²  ✓A

= 3 665 mm²  ✓CA

<table>
<thead>
<tr>
<th>1SF substitution</th>
<th>1A multiplication</th>
<th>1CA simplification</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓SF</td>
<td>✓A</td>
<td></td>
</tr>
</tbody>
</table>

Answer only full marks

12.3.1

13 (3)
### Question 3 (Adapted from Nov 2011, P1, Question 4.2)

| 3.1 | Volume \( = \text{length} \times \text{breadth} \times \text{height} \) \( \checkmark \text{M} \)  
\[ = 27.5 \, \text{cm} \times 15 \, \text{cm} \times 11.9 \, \text{cm} \]  
\[ = 4908.75 \, \text{cm}^3 \] \( \checkmark \text{A} \checkmark \text{A} \)  
| 1M substitution  
1A simplification  
1A correct unit  
| \( \text{Answer only full marks} \)  
| (3) | 12.3.1 |
| 3.2 | Number of boxes \( = \frac{118 \, \text{cm}}{11.9 \, \text{cm}} \) \( \checkmark \text{M} \)  
\[ = 9.915 \]  
\[ = 9 \] \( \checkmark \text{CA} \)  
| 1M division by 11.9 cm only  
| 1CA maximum  
| \( \text{Answer only full marks} \)  
| (2) | 12.1.1  
12.1.2 |
Question 4 (Adapted from Nov 2011, P2, Question 4.3)

4.1

Area of N wall = 2,984 m × 2,4 m ✓ SF
= 7,1616 m² ✓ A

Area of S wall = area of N wall – area of window
= 7,1616 m² – 2,08 m² ✓ M
= 5,0816 m² ✓ CA

Area of W wall = 3,304 × 2,4 ✓ SF
= 7,9296 m² ✓ A

Area of E wall = Area W wall – area of door
= 7,9296 m² – 2,2672 m² ✓ M
= 5,6624 m² ✓ CA

Total area = (7,1616 + 5,0816 + 7,9296 + 5,6624) m² ✓ M
= 25,8352 m²
≈ 25,84 m² ✓ CA

OR

Area of bedroom 2 = 2(area of W wall) + 2(area of S wall)
– area of window – area of door
✓ SF ✓ A ✓ A ✓ M ✓ M
= 2(3,304 m × 2,4m) + 2(2,984 m × 2,4 m) – (2,08 m² )
– (2,2672 m² ) ✓ M
✓ CA ✓ CA ✓ CA
= 15,8592 m² + 14,3232 m² – 4,3472 m³
= 25,8352 m²
≈ 25,84 m² ✓ CA

1SF substitution
1A area of N wall
1M subtracting areas
1CA area of S wall
1SF substitution
1A area of W wall
1M subtracting areas
1CA area of E wall
1M adding all areas
1CA simplification

1SF substitution
1A area of N wall
1A area of W wall
1M multiplying by 2
1M subtraction
3CA simplification
1CA final simplification

(10)
### 4.2

<table>
<thead>
<tr>
<th>Total area to be painted in both bedrooms</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ 25.84 \text{ m}^2 + 28.44 \text{ m}^2 ]</td>
</tr>
<tr>
<td>[ = 54.28 \text{ m}^2 \quad \checkmark \text{CA} ]</td>
</tr>
<tr>
<td>[ \checkmark \text{M} ]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Amount of paint required</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ \frac{54.28 \text{ m}^2}{4 \text{ m}^2 / \ell} \quad \text{OR} \quad \frac{54.28 \text{ m}^2}{20 \text{ m}^2 \text{ per tin}} ]</td>
</tr>
<tr>
<td>[ = 13.57 \ell \quad \checkmark \text{CA} ]</td>
</tr>
<tr>
<td>[ = 2.714 \text{ tins} ]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of 5 \ell containers</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ \frac{13.57 \ell}{5 \ell} ]</td>
</tr>
<tr>
<td>[ \approx 2.714 ]</td>
</tr>
</tbody>
</table>

\[ \therefore 3 \text{ containers are needed.} \]

<table>
<thead>
<tr>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ = \text{R}169.99 \quad \checkmark \text{CA} ]</td>
</tr>
<tr>
<td>[ = \text{R}509.97 ]</td>
</tr>
</tbody>
</table>

Mrs Wong’s estimation was INCORRECT \[ \checkmark \text{O} \]

**OR**

4 \text{ m}^2 \text{ is covered by } 1 \ell \text{ of paint} \[ \checkmark \text{M} \]

1 \text{ m}^2 \text{ is covered by } \frac{1}{4} \ell \text{ of paint} \[ \checkmark \text{M} \]

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<th>Total area to be painted in both bedrooms</th>
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<tr>
<td>[ = 54.28 \text{ m}^2 \quad \checkmark \text{CA} ]</td>
</tr>
<tr>
<td>[ \checkmark \text{M} ]</td>
</tr>
</tbody>
</table>

| \[ 54.28 \text{ m}^2 \text{ is covered by } \frac{1}{4} \times 54.28 \ell \text{ of paint} \] |
| \[ = 13.57 \ell \quad \checkmark \text{CA} \] |
| \[ \checkmark \text{M} \] |

<table>
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\[ \therefore 3 \text{ containers are needed.} \]

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<table>
<thead>
<tr>
<th>12.1.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1CA simplification</td>
</tr>
<tr>
<td>1M dividing</td>
</tr>
<tr>
<td>1CA simplification</td>
</tr>
<tr>
<td>1M dividing by 5 \ell</td>
</tr>
<tr>
<td>1R rounding up</td>
</tr>
<tr>
<td>1CA cost</td>
</tr>
<tr>
<td>1O correct conclusion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>12.1.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1CA cost</td>
</tr>
<tr>
<td>1O correct conclusion (7)</td>
</tr>
</tbody>
</table>
4.3

Total number of hours worked = \( (6 + 6 \times \frac{1}{2}) \) hours  
\[= 15 \text{ hours} \]

Total labour cost = 15 \times R35,90  
\[= R538,50 \quad \checkmark \text{CA} \]

\[\therefore \text{The invoice amount was incorrect.} \checkmark \text{O} \]

\textbf{OR}

\[\checkmark \text{M} \quad \checkmark \text{A} \]

Total labour cost  
\[= 6 \times R35,90 + 6 \times 1 \frac{1}{2} \times R35,90 \]
\[= R538,50 \quad \checkmark \text{CA} \]

\[\therefore \text{The invoice amount was incorrect.} \checkmark \text{O} \]

\textbf{OR}

Rate on Saturdays  
\[= R35,90 + \frac{1}{2} \times R35,90 = R53,85 \]

Labour cost on Saturday  
\[= 6 \times R53,85 = R323,10 \quad \checkmark \text{CA} \]

Labour cost on Friday  
\[= 6 \times R35,90 = R215,40 \quad \checkmark \text{A} \]

Total payment  
\[= R323,10 + R215,40 = R538,50 \quad \checkmark \text{M} \]

\[\therefore \text{The invoice amount was incorrect.} \checkmark \text{O} \]