

**GRADE 12**

**MATHEMATICAL LITERACY P2**

**EXEMPLAR 2008**

***MARKING MEMORANDUM***

**This memorandum consists of 16 pages**

**Question 1**

1.1.1a	Interest = Amount Invested x Interest Rate x Number of time periods  = R50 000 x 7,2% x 1 ✓  = R3 600 ✓	Concept  Answer  (2)
1.1.1b	Fill value on table (see completed Table on page 5) ✓	Filling  (1)
1.1.2a	(i) Annual salary (before deductions)  = 12 x R10 560,00 ✓  = R126 720 ✓	Concept  Answer  (2)
	(ii) Bonus = R10 560,00 ✓	Filling  (1)
1.1.2b	Sub Total A  = R125 720,00 + R10 560,00 + R3 600 ✓  = R140 880,00 ✓	Addition  Filling  (2)
1.1.3a	Annual medical aid contributions  = 12 x R495,00 ✓  = R5 940,00 ✓	Concept  Answer  (2)
1.1.3b	Annual pension fund contributions  = 12 x R792,00 ✓  = R9 504,00 ✓	Concept  Answer  (2)
1.1.3c	SUB-TOTAL B  = Medical Aid + Pension Fund contributions  = R5 940,00 + R9 504,00 ✓  = R15 444,00 ✓	Concept  Answer  (2)
1.1.3d	Taxable Income  = SUB-TOTAL 1 – SUB-TOTAL B  = R140 880,00 – R15 444,00 ✓  = R125 436,00 ✓	Concept  Answer  (2)

1.1.4a	<p>SUB-TOTAL C</p> <p>= Total tax payable</p> <p>= R18 000 + 25% of R25 436,00 ✓</p> <p>= R18 000 + R6 359,00 ✓</p> <p>= R24 359,00 ✓ ✓</p>		<p>Concept</p> <p>Substitution</p> <p>Answer Filling</p> <p>(4)</p>
1.1.4b	<p>SUB-TOTAL D</p> <p>= Total PAYE contributions</p> <p>= 12 x R1 918,77 + R1 918,77 ✓ ✓</p> <p>= R24 343,01 ✓ ✓</p>		<p>Annual PAYE</p> <p>PAYE on bonus</p> <p>Answer Filling</p> <p>(4)</p>
1.1.4c	<p>Total amount owing to Patsy</p> <p>= R24 359,00 – R24 343,01 ✓</p> <p>= R15,99 ✓</p>		<p>Concept</p> <p>Answer</p> <p>(2)</p>
1.2.1a	(i)	<p>Amount spent on Education in the 2000/2001 Financial Year</p> <p>= <math>\frac{44 \text{ billion}}{111 \text{ billion}} \times 100\%</math> ✓ ✓</p> <p>= 39,6% ✓</p>	<p>Concept Calculation</p> <p>Answer</p> <p>(3)</p>
1.2.1a	(ii)	<p>Amount spent on Education in the 2003/2004 Financial Year</p> <p>= <math>\frac{62 \text{ billion}}{171 \text{ billion}} \times 100\%</math> ✓</p> <p>= 36,3% ✓</p>	<p>Calculation</p> <p>Answer</p> <p>(2)</p>
1.2.1b	<p>The percentage of the total expenditure that was spent on education decreased between the 2000/2001 Financial Year and the 2003/2004 Financial Year.</p>		<p>Concept Answer</p> <p>(2)</p>
1.2.2	<p>The statement is correct.</p> <p>It can be seen from the graph that the total expenditure is increasing at a far greater rate than the spending on education and health.</p>		<p>Answer 1</p> <p>Well thought-out reason 2</p> <p>(3)</p>

1.2.3 Spending on Education and on Health has not increased at the same rate.

**EXPLANATION 1**

From the graph it can be seen that the Education graph increases at a slightly faster rate than the Health graph.

**EXPLANATION 2**

The increase in spending can be compared:

	<b>Education</b>	<b>Health</b>
2000/2001	R44 billion	R26 billion
increase	+ R4 billion	+ R 3 billion
2001/2002	R48 billion	R29 billion
increase	+ R6 billion	+ R3 billion
2002/2003	R54 billion	R32 billion
increase	+ R8 billion	+ R4 billion
2003/2004	R62 billion	R36 billion

It can be seen that the spending on Education has increased at a far greater rate than the spending on Health.

**EXPLANATION 3**

The difference between the amount spent on Education and the amount spent on Health can be found:

	<b>Education</b>	<b>Health</b>	<b>Education – Health</b>
2000/2001	R44 billion	R26 billion	R18 billion
2001/2002	R48 billion	R29 billion	R19 billion
2002/2003	R54 billion	R32 billion	R22 billion
2003/2004	R62 billion	R36 billion	R26 billion

It can be seen that the difference is increasing in size – which shows us that they are not increasing at the same rate.

Answer 1

Well thought out reason 3

(4)

## ANNEXURE A

## Question 1.2

<b>TABLE 2: CALCULATION OF TAX LIABILITY (1 March 20 to 28 February 07)</b>	
<b>1. INCOME RECEIVED</b>	
Annual Salary	R126 720,00
Bonus	R10 560,00
Dividends from South African banks	R3 600,00
<b>SUB-TOTAL A = Total income received</b>	<b>140 800,00</b>
<b>2. MEDICAL AID AND PENSION FUND</b>	
Annual medical aid contributions	R5 940,00
Annual pension fund contributions	R9 504,00
<b>SUB-TOTAL B = Medical Aid + Pension Fund Contributions</b>	<b>R15 444,00</b>
<b>3. TAXABLE INCOME</b>	
<b>SUB-TOTAL A – SUB-TOTAL B</b>	<b>R125 436,00</b>
<b>4. TOTAL TAX PAYABLE (use tax tables for calculation)</b>	
<b>SUB-TOTAL C = Total tax payable</b>	<b>R24 359</b>
<b>5. PAYE</b>	
Annual PAYE contributions	R23 037,24
PAYE contribution from bonus	R1 918,77
<b>SUB-TOTAL D = Total PAYE contributions</b>	<b>R24 956,01</b>
<b>6. TOTAL AMOUNT PAYABLE BY/TO YOU (The difference between SUB-TOTAL C AND SUB-TOTAL D)</b>	<b>R15,99</b>

**Question 2**

2.1.1	Increase in the 21 kl to 40 kl category $= \frac{R8,80 - R8,40}{R8,40} \times 100\% \quad \checkmark$ $= \frac{R0,40}{R8,40} \times 100\% \quad \checkmark$ $= R4,76\%$	Concept  Answer (2)
2.1.2	Increase $= \frac{R10,40 - R9,90}{R9,90} \times 100\% \quad \checkmark$ $= \frac{R0,50}{R9,90} \times 100\%$ $= 5,05\% \quad \checkmark$	Concept  Answer (2)
2.2	Cost of using 45 kl of water per month in 2007/2008 $= R0,00 + R29,50 + R37,00 + R88,00 + R52,00 \quad \checkmark$ $= R206,50 \quad \checkmark$	Concept  Answer (2)
2.3.1	Mean water consumption $= \frac{25 + 23 + 25 + 25 + 30 + 26 + 26 + 30 + 22 + 25 + 22 + 37}{12} \quad \checkmark$ $= \frac{316}{12} \quad \checkmark$ $= 26,3 \text{ kl} \quad \checkmark$	Concept Calculation  Answer (3)
2.3.2a	$26,3 \text{ kl} = 10 \text{ kl} + 5 \text{ kl} + 5 \text{ kl} + 6,3 \text{ kl} \quad \checkmark$ Average monthly payment in 2006/2007 $= (10 \text{ kl} \times R0,00) + (5 \text{ kl} \times R5,60) + (5 \text{ kl} \times R7,00) + (6,3 \text{ kl} \times R8,40)$ $= R0,00 + R28,00 + R35,00 + R52,92 \quad \checkmark$ $= R115,92 \quad \checkmark$	Concept  Calculation answer (3)
2.3.2b	Average monthly payment in 2007/2008 $= (10 \text{ kl} \times R0,00) + (5 \text{ kl} \times R5,90) + (5 \text{ kl} \times R7,40) + (6,3 \text{ kl} \times R8,80)$ $= R0,00 + R29,50 + R37,00 + R55,44 \quad \checkmark$ $= R121,90 \quad \checkmark$	Concept  Answer (2)

2.3.3	<p>Increase in cost between 2006/2007 and 2007/2008</p> $= \frac{R121,90 - R115,92}{R115,92} \times 100\% \quad \checkmark$ $= \frac{R5,98}{R115,92} \times 100\%$ $= 5,16\% \quad \checkmark$	<p>Concept</p> <p>Answer</p> <p>(2)</p>
2.4	<p>Different answers are possible. Reasons must be given for the answer.</p> <p>Here is one possibility:</p> <p>Looking at the percentage increases of the different categories we get 5,36%, 5,71%, 4,76% and 5,05%. Except for the percentage increase in the category 21 kℓ to 40 kℓ of 4,76%, the increases were all more than 5%. The average of these four percentages is, in fact, 5,22%, which is approximately 5% (rounded off to one significant place).</p> <p>The Ntuli's increase was 5,16%, which is approximately 5% (rounded off to one significant place).</p> <p>This means that, on the whole, the headlines were correct.</p>	<p>1 for answer</p> <p>2 for reason(s)</p> <p>(3)</p>
		<b>[19]</b>

**Question 3**

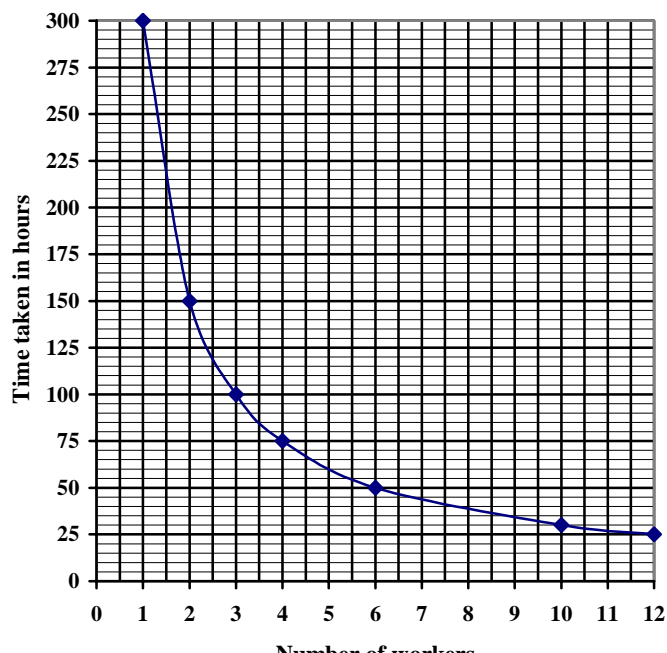
3.1.1	Most Hepatitis A is found in Western Cape	(1)																																								
3.1.2	Most Cholera cases are found in Eastern Cape	(1)																																								
3.1.3	Most Measles cases are found in Mpumalanga	(1)																																								
3.2	<p style="text-align: center;"><b>PREVALENCE OF VARIOUS DISEASES IN SOUTH AFRICA</b></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Data from Prevalence of Various Diseases in South Africa</caption> <thead> <tr> <th>Province</th> <th>Hepatitis A (%)</th> <th>Cholera (%)</th> <th>Measles (%)</th> </tr> </thead> <tbody> <tr> <td>EC</td> <td>10</td> <td>80</td> <td>15</td> </tr> <tr> <td>FS</td> <td>25</td> <td>0</td> <td>1</td> </tr> <tr> <td>GP</td> <td>1</td> <td>0</td> <td>35</td> </tr> <tr> <td>KZN</td> <td>1</td> <td>15</td> <td>1</td> </tr> <tr> <td>LP</td> <td>5</td> <td>0</td> <td>8</td> </tr> <tr> <td>MP</td> <td>1</td> <td>5</td> <td>22</td> </tr> <tr> <td>NC</td> <td>8</td> <td>0</td> <td>1</td> </tr> <tr> <td>NW</td> <td>1</td> <td>0</td> <td>18</td> </tr> <tr> <td>WC</td> <td>68</td> <td>0</td> <td>4</td> </tr> </tbody> </table>	Province	Hepatitis A (%)	Cholera (%)	Measles (%)	EC	10	80	15	FS	25	0	1	GP	1	0	35	KZN	1	15	1	LP	5	0	8	MP	1	5	22	NC	8	0	1	NW	1	0	18	WC	68	0	4	<p style="text-align: center;">1 mark for each province</p> <p style="text-align: right;">(9)</p>
Province	Hepatitis A (%)	Cholera (%)	Measles (%)																																							
EC	10	80	15																																							
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NW	1	0	18																																							
WC	68	0	4																																							
		<b>[12]</b>																																								





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<p>= 101 943 000</p> <p>Number allowed in 2012</p> <p>= number allowed in 2011 + 6 759 000</p> <p>= 101 943 000 + 6 759 000</p> <p>= 108 702 000</p> <p>Number allowed in 2013</p> <p>= number allowed in 2012 + 6 759 000</p> <p>= 108 702 000 + 6 759 000</p> <p>= 112 461 000</p> <p>Number allowed in 2014</p> <p>= number allowed in 2013 + 6 759 000</p> <p>= 112 461 000 + 6 759 000</p> <p>= 119 220 000</p> <p>So it is only in 2014 that the number is exceeded</p>	
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4.2.1	<p style="text-align: center;">TIME TAKEN TO SEW ✓ SHII ✓</p>  <table border="1" style="display: none;"> <caption>Data points from the graph</caption> <thead> <tr> <th>Number of workers</th> <th>Time taken in hours</th> </tr> </thead> <tbody> <tr><td>1</td><td>300</td></tr> <tr><td>2</td><td>150</td></tr> <tr><td>3</td><td>100</td></tr> <tr><td>4</td><td>75</td></tr> <tr><td>6</td><td>50</td></tr> <tr><td>10</td><td>30</td></tr> <tr><td>12</td><td>25</td></tr> </tbody> </table>	Number of workers	Time taken in hours	1	300	2	150	3	100	4	75	6	50	10	30	12	25	(4)
Number of workers	Time taken in hours																	
1	300																	
2	150																	
3	100																	
4	75																	
6	50																	
10	30																	
12	25																	
4.2.2	<p>Number of workers <math>\times</math> time taken = 300 ✓ ✓</p>	(2)																
4.2.3	<p>Time taken for 1 worker to sew 1 T-shirt = 1 hour ✓</p> <p>Time taken for 6 workers to sew 1 T-shirt = <math>\frac{1}{6}</math> hour ✓</p> <p>Time taken for 6 workers to sew 1 800 T-shirts</p> <p><math>= 1\ 800 \times \frac{1}{6} = \frac{1800}{6} = 300</math> hours ✓</p>	<p>Proportion</p> <p>Answer</p> <p>(2)</p>																
		<b>[23]</b>																

**QUESTION 5**

<p>5.1.1</p>	<p>The number of cups that can be filled from one bottle</p> $= \frac{2\ell}{200\text{m}\ell}$ $= \frac{2\,000\text{m}\ell}{200\text{m}\ell}$ $= 10$ <p>The number of cups that can be filled from 60 bottles</p> $= 60 \times 10$ $= 600$	<p>Conversion ✓</p> <p>Concept</p> <p>Answer ✓</p> <p>(3)</p>
<p>5.1.2</p>	<p>Total cost</p> $= 60 \times \text{R}9,99 + 600 \times \text{R}0,20$ $= \text{R}599,40 + \text{R}120,00$ $= \text{R}719,40$	<p>Concept ✓</p> <p>Calculation ✓</p> <p>Answer ✓</p> <p>(3)</p>
<p>3.1.3</p>	<p>Money made from the sale of the soft drink</p> $= 600 \times \text{R}3,00$ $= \text{R}1\,800,00$ <p>Total cost = R719,40</p> <p>Profit = Money made – Total cost</p> $= \text{R}1\,800 - \text{R}719,40$ $= \text{R}1\,080,60$	<p>Calculation of money made</p> <p>Use of total cost</p> <p>Concept of profit</p> <p>Answer</p> <p>(4)</p>
<p>5.2.1 a</p>	<p>Area of northern wall to be painted with blue gloss paint</p> <p>= area of bottom half of the wall – area of portion of windows – area of the bottom portion of the door</p> $= (12\text{ m} \times 1,5\text{ m}) - 5 \times (0,5\text{ m} \times 0,45\text{ m}) - 1,5\text{ m} \times 0,9\text{ m}$ $= 18\text{ m}^2 - 5 \times 0,225\text{ m}^2 - 1,35\text{ m}^2$ $= 18\text{ m}^2 - 1,125\text{ m}^2 - 1,35\text{ m}^2$ $= 15,525\text{ m}^2$	<p>Concept</p> <p>Substitution</p> <p>Subtraction</p> <p>Part Answer (4)</p>

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	<p>Area of western wall to be painted with blue paint</p> <p>= area of bottom half of the wall – area of half of chalkboard</p> <p>= <math>(8\text{ m} \times 1,5\text{ m}) - (0,5\text{ m} \times 4\text{ m})</math> ✓</p> <p>= <math>12\text{ m}^2 - 2\text{ m}^2</math></p> <p>= <math>10\text{ m}^2</math> ✓</p> <p>Area of eastern wall to be painted with blue paint</p> <p>Area of bottom half of wall + area of pin board</p> <p>= <math>(8\text{ m} \times 1,5\text{ m}) + (1\text{ m} \times 6\text{ m})</math> ✓</p> <p>= <math>12\text{ m}^2 + 6\text{ m}^2</math></p> <p>= <math>18\text{ m}^2</math> ✓</p> <p>Area of southern wall to be painted with blue paint</p> <p>= <math>12\text{ m} \times 1,5\text{ m}</math> ✓</p> <p>= <math>18\text{ m}^2</math> ✓</p> <p>Total area to be painted with blue paint</p> <p>= <math>15,525\text{ m}^2 + 10\text{ m}^2 + 18\text{ m}^2 + 18\text{ m}^2</math> ✓</p> <p>= <math>61,525\text{ m}^2</math> ✓</p>	<p>Concept</p> <p>Part Answer (2)</p> <p>Concept</p> <p>Part Answer (2)</p> <p>Concept</p> <p>Part Answer (2)</p> <p>Concept</p> <p>Part Answer (2)</p> <p>TOTAL (12)</p>
<p>5.2.1 b</p>	<p>Area of the northern wall to be painted with white PVA</p> <p>= area of top half of wall – area of top portion of the windows – area of top portion of the door</p> <p>= <math>(12\text{ m} \times 1,5\text{ m}) - 5 \times (0,45\text{ m} \times (1,2\text{ m} - 0,5\text{ m})) - (0,9\text{ m} \times 1\text{ m})</math> ✓</p> <p>= <math>18\text{ m}^2 - 5 \times (0,45\text{ m}^2 \times 0,7\text{ m}^2) - 0,9\text{ m}^2</math></p> <p>= <math>18\text{ m}^2 - (5 \times 0,315\text{ m}^2) - 0,9\text{ m}^2</math></p> <p>= <math>18\text{ m}^2 - 1,575\text{ m}^2 - 0,9\text{ m}^2</math></p> <p>= <math>15,525\text{ m}^2</math> ✓</p>	<p>Concept</p> <p>Substitution</p> <p>Subtraction</p> <p>Part Answer (4)</p>

	<p>Area of the western wall to be painted with white PVA</p> <p>= area of top half of the wall – area of top half the chalkboard</p> <p>✓ ✓</p> <p>= <math>(8 \text{ m} \times 1,5 \text{ m}) - (4 \text{ m} \times 0,5 \text{ m})</math></p> <p>= <math>12 \text{ m}^2 - 2 \text{ m}^2</math></p> <p>= <math>10 \text{ m}^2</math> ✓</p> <p>Area of the eastern wall</p> <p>= area of top half of wall – area of pin board</p> <p>✓ ✓</p> <p>= <math>(8 \text{ m} \times 1,5 \text{ m}) - (6 \text{ m} \times 1 \text{ m})</math></p> <p>= <math>12 \text{ m}^2 - 6 \text{ m}^2</math></p> <p>= <math>6 \text{ m}^2</math> ✓</p> <p>Area of the southern wall</p> <p>= area of top half of wall – area of 5 windows</p> <p>✓ ✓</p> <p>= <math>(12 \text{ m} \times 1,5 \text{ m}) - 5 \times (0,45 \text{ m} \times 0,45 \text{ m})</math></p> <p>= <math>18 \text{ m}^2 - 5 \times 0,2025 \text{ m}^2</math></p> <p>= <math>16,9875 \text{ m}^2</math> ✓</p> <p>Total area to painted with PVA</p> <p>= <math>15,525 \text{ m}^2 + 10 \text{ m}^2 + 6 \text{ m}^2 + 16,9875 \text{ m}^2</math> ✓</p> <p>= <math>48,5125 \text{ m}^2</math> ✓</p>	<p>Concept</p> <p>Substitution</p> <p>Part Answer (3)</p> <p>Concept</p> <p>Substitution</p> <p>Part Answer (3)</p> <p>Concept</p> <p>Substitution</p> <p>Part Answer (3)</p> <p>Concept</p> <p>Part Answer (2)</p> <p>TOTAL (15)</p>
<p>5.2.2 a</p>	<p>BLACKBOARD PAINT:</p> <p>Area of chalkboard = <math>4 \text{ m} \times 1 \text{ m} = 4 \text{ m}^2</math> ✓</p> <p><math>4 \text{ m}^2</math> is covered by <math>1 \ell</math> ✓</p> <p>So <math>1 \ell</math> of chalkboard paint is needed</p>	<p>Area of chalkboard</p> <p>Answer</p> <p>(2)</p>

<p>5.2.2 b</p>	<p>BLUE GLOSS PAINT:</p> <p>8 m<sup>2</sup> is covered by 1 ℓ</p> <p>So 1 m<sup>2</sup> is covered by <math>\frac{1}{8}\ell</math> ✓</p> <p>Then 61,525 m<sup>2</sup> will be covered by <math>\frac{1}{8} \times 61,525 \ell = 7,690625 \ell</math>  <math>\approx 8 \ell</math> ✓</p>	<p>Proportion</p> <p>Answer</p> <p>(2)</p>
<p>5.2.2 c</p>	<p>PVA:</p> <p>6 m<sup>2</sup> is covered by 1 ℓ</p> <p>So 1 m<sup>2</sup> is covered by <math>\frac{1}{6}\ell</math> ✓</p> <p>Then 48,5125 m<sup>2</sup> will be covered by <math>\frac{1}{6} \times 48,5125 \ell</math>  <math>= 8,085416667 \ell</math>  <math>\approx 9 \ell</math> ✓</p>	<p>Proportion</p> <p>Answer</p> <p>(2)</p>
<p>5.2.3</p>	<p>5 × cost of 1 ℓ of Blue Gloss Paint or White PVA  <math>= 5 \times R92,00 = R460,00</math> ✓</p> <p>So it is cheaper to buy one 5 ℓ tin of blue gloss paint or white PVA than to buy five 1-litre tins.</p> <p>Cost of buying 8 ℓ of Blue Gloss Paint  <math>= \text{cost of buying one 5 ℓ tin} + \text{three 1 ℓ tins}</math>  <math>= 1 \times R289,00 + 3 \times R92,00</math>  <math>= R289,00 + R276,00</math>  <math>= R563,00</math></p> <p>4 × cost of 1 ℓ of White PVA = 4 × R92,00 = R368,00. ✓</p> <p>It is cheaper to buy one 5 ℓ tin of white PVA paint than to buy four 1 ℓ tins of paint. So, it is cheaper to buy two 5 ℓ tins of white PVA paint than to buy 5 ℓ + (4 × 1 ℓ) of paint.</p> <p>Cost of buying 9 ℓ of White PVA  <math>= \text{cost of buying 10 ℓ of paint}</math>  <math>= 2 \times R220,00</math>  <math>= R440,00</math> ✓</p>	<p>Concept that it is cheaper to buy one 5 ℓ tin than to buy four 1 ℓ tins</p> <p>Substitution</p> <p>Part Answer (4)</p> <p>Concept that it is cheaper to buy two 5 ℓ tins than to buy one 5 ℓ and four 1 ℓ tins</p> <p>Substitution</p> <p>Part Answer (3)</p>

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	<p>Total cost of painting the classroom ✓</p> <p>= cost of buying 7 ℓ of Blue Gloss + cost of buying 10 ℓ of White PVA + cost of buying 1 ℓ of Chalkboard Paint + cost of 4 mohair rollers + cost of 4 paint trays ✓</p> <p>= R563,00 + R440,00 + R79,00 + (4 × R30,00) + (4 × R13,00)</p> <p>= R563,00 + R440,00 + R79,00 + R120,00 + R52,00</p> <p>= R1 254,00 ✓</p>	<p>Addition</p> <p>Substitution</p> <p>Answer</p> <p>(3)</p> <p>TOTAL (10)</p>
5.3	<p>Amount earned from the sale of soft drinks = R1 080,00</p> <p>Total cost of painting the classroom = R1 254,00 ✓</p> <p>The still need R1 254,00 – R1 080,60 = R173,40 ✓</p>	<p>Answer</p> <p>interpretation</p> <p>(2)</p>
		<b>[55]</b>

**TOTAL: 150 marks**