



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P2

NOVEMBER 2010

MEMORANDUM

MARKS: 150

SYMBOL	EXPLANATION
A	Accuracy
CA	Consistent accuracy
C	Conversion
J	Justification (Reason/Opinion)
M	Method
MA	Method with accuracy
P	Penalty for no units, incorrect rounding off, etc.
R	Rounding off
RT/RG	Reading from a table/Reading from a graph
S	Simplification
SF	Correct substitution in a formula
O	Own opinion

This memorandum consists of 21 pages.

QUESTION 1 [26 MARKS]

Ques	Solution	Explanation	AS
1.1.1 (a)	<p style="text-align: center;">OR</p> <p>Diameter of tablecloth $= 4 \times 30 \text{ cm}$ $= 120 \text{ cm}$ ✓M</p> <p>Radius of tablecloth $= 120 \div 2$ $= 60 \text{ cm}$ ✓CA</p> <p style="text-align: center;">OR</p> <p>Radius of placemat $= 30 \div 2 \text{ cm}$ $= 15 \text{ cm}$ ✓M</p> <p>Radius of tablecloth $= 4 \times 15 \text{ cm}$ $= 60 \text{ cm}$ ✓CA</p> <p>Circumference of table cloth $= 2\pi \times \text{radius}$ $= 2 \times 3,14 \times 60 \text{ cm}$ ✓SF $= 376,8 \text{ cm}$ ✓CA</p>	<p>1M finding diameter or radius</p> <p>1CA radius of tablecloth</p> <p>1SF substitution into correct formula</p> <p>1CA circumference with correct unit</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">Using π (376,99 cm)</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">Using $\frac{22}{7}$ (377,14 cm)</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">Max 2 marks if incorrect radius Max 1 mark if radius of placemat is used</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto; text-align: center;">Answer only full marks</div> <p style="text-align: right;">(4)</p>	12.3. 1
1.1.1 (b)	<p>Number of segments $= \frac{376,8}{4,71}$ ✓M $= 80$ ✓CA</p>	<p>1M dividing by 4,71</p> <p>1CA number of segments</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">80,04 OR 80,07</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto; text-align: center;">No penalty for rounding</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto; text-align: center;">Answer only full marks</div> <p style="text-align: right;">(2)</p>	12.3. 1 12.1. 1

Ques	Solution	Explanation	AS
1.2.1 (a)	<p>Total cost $\checkmark A$ $= R300 + R0,50 \times (\text{number of minutes more than } 500)$ $\checkmark A$</p> <p style="text-align: center;">OR</p> <p>Total cost = $R300 + R0,50 \times x$, $\checkmark A$ Where x = number of minutes more than 500</p>	<p>1A constant value R300 1A second term</p> <p>1A constant value R300 1A second term</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">No penalty if R omitted</div> <p style="text-align: right;">(2)</p>	12.2.1
1.2.1 (b)	<p>Total cost = $R300 + R0,50 \times (510 - 500)$ $\checkmark M$ $\checkmark SF$ $= R300 + R5$ $\checkmark S$ $= R305$ $\checkmark CA$</p> <p style="text-align: center;">OR</p> <p>Cost of calls = $R0,50 \times 10$ $\checkmark M$ $= R5,00$ $\checkmark CA$</p> <p>Total cost = $R300,00 + R5,00$ $\checkmark M$ $= R305,00$ $\checkmark CA$</p>	<p>1M use of formula from 1.2.1(a) 1SF substitution of minutes 1S simplifying 1CA solution</p> <p>1M calculating extra cost 1CA simplifying</p> <p>1M calculating total cost 1CA solution</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">No penalty for units</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">Answer only full marks</div> <p style="text-align: right;">(4)</p>	12.2.1

Ques	Solution	Explanation	AS
1.2.2	<p>NOTE: To assist with marking, the graph that the learners have to draw has been given as a dotted line. The learners DO NOT have to draw a dotted line.</p> <p style="text-align: center;">LANDLINE CALL PACKAGES</p> <p>PACKAGE 1: 1A point (0;150) 1A horizontal line from (0;150) to the point (100;150) 1A another correct point 1G for having a break-even point between (100;150) and (500;350) 1A for totally correct straight line that must be up to the point (1000; 600))</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-top: 10px;"> No penalty if label is omitted </div>		12.2.2

(5)

Ques	Solution	Explanation	AS
1.2.3(a)	<p>The break-even point is the point where:</p> <ul style="list-style-type: none"> • the two graphs intersect. ✓✓M <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> • both packages cost the same ✓✓M <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> • there is no profit/gain or loss ✓✓M <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> • both situations are the same ✓✓M 	<p>2M description of break-even point</p> <p>(other correct definitions)</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">2 Marks or zero</div> <p style="text-align: right;">(2)</p>	12.2.3
1.2.3(b)	<p>Number of minutes used = 400 ✓RG</p> <p>Total cost = R 300 ✓RG</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">CA from graph</div> <p>1RG number of minutes</p> <p>1RG cost</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px auto;">Accept (400 ; 300) Point may be calculated algebraically</div> <p style="text-align: right;">(2)</p>	12.2.3
1.2.4	<p>Package 2 ✓✓CA ✓RG Reading 900 minutes and 1 000 minutes Showing difference ✓M</p> <p style="text-align: center;">✓CA Package 2 gives 100 minutes more call time for R550 than Package 1 ✓1J</p> <p style="text-align: center;">OR</p> <p>She must accept Package 2 ✓CA ✓CA</p> <p>Package 1: $550 = 150 + 0,50 \times x$, ✓M $550 - 150 = 0,50 x$ $x = \frac{400}{0,5} = 800$ Total minutes = $100 + 800 = 900$ ✓CA</p> <p>Package 2: $550 = 300 + 0,50 \times x$ $550 - 300 = 0,50 x$ $x = \frac{250}{0,5} = 500$ Total minutes = $500 + 500 = 1\ 000$ ✓CA</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 10px;">CA from graph</div> <p>2CA selecting correct package 1RG reading from the graph 1M difference</p> <p>1J motivation</p> <p>2CA selecting correct package</p> <p>1M using formula</p> <p>1CA simplification</p> <p>1CA simplification</p> <p style="text-align: right;">(5)</p>	12.2.3

QUESTION 2 [28 MARKS]			
Ques	Solution	Explanation	AS
2.1.1	C3 OR 3C ✓A ✓A	1A for C 1A for 3 (2)	12.3.4
2.1.2	SE OR South East OR East of South OR South of East ✓A ✓A	2A correct direction <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">2 Marks or zero</div> (2)	12.3.4
2.1.3(a)	<ul style="list-style-type: none"> • Carry on along Selby Msimang Road in a (North-Easterly) direction.: ✓A • At the traffic lights turn right into Sutherland Road ✓A • then turn right into F.J. Sithole Road ✓A • then turn left into Nkugwini Road ✓A • entrance to the stadium is on the left. 	1A recognising direction 1A turn into Sutherland Rd 1A turn into F.J. Sithole Rd 1A turn into Nkugwini Rd <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">Follow learner's route on map. If direction very long Max 2 marks Max 3 marks if names of roads listed only in correct order</div> (4)	12.3.4
2.1.3(b)	Distance on map = 145 mm ✓A Actual distance = 145 mm × 20 000 ✓M = 2 900 000 mm ✓CA = 2,9 km ✓CA	1A distance on map (Accept 130 mm – 150 mm) 1M multiplying by the scale 1CA distance in mm 1CA distance in km <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">Accept measurement in cm Accept 2,6 km – 3,0 km</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">Answer only full marks</div> (4)	12.3.1 12.3.3

<p>2.1.4</p>	<p>Average speed = $\frac{\text{distance}}{\text{time}}$</p> <p>$40 \text{ km/h} = \frac{2,9 \text{ km}}{\text{time}} \quad \checkmark \text{SF}$</p> <p>$\text{Time} = \frac{2,9 \text{ km}}{40 \text{ km/h}} \quad \checkmark \text{M}$</p> <p>$= 0,0725 \text{ hours} \quad \checkmark \text{S}$</p> <p>$= 0,0725 \times 60 \text{ minutes} \quad \checkmark \text{C}$</p> <p>$= 4,35 \text{ minutes}$</p> <p>Arrival = 09:15 + 4,35minutes $\checkmark \text{CA}$ $= 09\text{H } 19,35\text{minutes OR } 09:19:21$</p> <p>$\therefore$ the bus driver's estimated time of arrival is correct. $\checkmark \text{CA}$</p> <p style="text-align: center;">OR</p> <p>Speed = $\frac{\text{distance}}{\text{time}}$</p> <p>$40 \text{ km/h} = \frac{\text{distance}}{5 \text{ minutes}} \quad \checkmark \text{SF} \quad \checkmark \text{M}$</p> <p>Distance = $40 \times \frac{5}{60} \text{ km} \quad \checkmark \text{C}$ $= 3,33 \text{ km} \quad \checkmark \text{CA}$</p> <p>$\therefore$ it is possible for him to be at the stadium at 09:20 $\checkmark \text{CA}$ He can cover a longer distance than he need to cover in 5 minutes $\checkmark \text{CA}$</p> <p style="text-align: center;">OR</p> <p>Speed = $\frac{\text{distance}}{\text{time}}$</p> <p>$= \frac{2,9 \text{ km}}{5 \text{ minutes}} \quad \checkmark \text{CA} \quad \checkmark \text{A}$</p> <p>$= 2,9 \text{ km} \times \frac{60}{5} \text{ hour} \quad \checkmark \text{C}$ $= 34,8 \text{ km/h} \quad \checkmark \text{CA}$</p> <p>$\therefore$ He has 5 minutes to get to the stadium and can travel at 34,8 km/h and still arrive on time $\checkmark \text{CA}$</p>	<p>12.3.1</p> <p>1SF/CA substitution 12.3.2</p> <p>1M rearranging the formula 12.2.1</p> <p>1S simplification</p> <p>1C converting to minutes</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>Range from 3,9 to 4,5 minutes</p> </div> <p>1CA time of arrival</p> <p>1CA conclusion</p> <p>1SF/CA substitution</p> <p>1M rearranging the formula</p> <p>1C converting to minutes</p> <p>1CA simplification</p> <p>1CA conclusion</p> <p style="text-align: center;">OR</p> <p>1CA conclusion</p> <p>1CA substituting distance</p> <p>1A substituting time</p> <p>1C converting to minutes</p> <p>1CA simplification</p> <p>1CA comparison of speed</p> <p>1CA conclusion</p>	<p>12.3.1</p> <p>12.3.2</p> <p>12.2.1</p> <p>(6)</p>
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Ques	Solution	Explanation	AS																																																												
2.2.1	<div style="text-align: center;"> <table border="0"> <tr> <td></td> <td>PANTS</td> <td>SHIRT</td> <td>TIE</td> <td>POSSIBLE OUTCOMES</td> </tr> <tr> <td></td> <td></td> <td></td> <td>T</td> <td>→ LP; LS; T</td> </tr> <tr> <td></td> <td></td> <td>LS</td> <td>NT</td> <td>→ LP; LS; NT ✓CA</td> </tr> <tr> <td></td> <td>LP</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>T ✓A</td> <td>→ LP; SS; T ✓CA</td> </tr> <tr> <td></td> <td></td> <td>SS</td> <td>NT</td> <td>→ LP; SS; NT</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>T</td> <td>→ SP; LS; T ✓CA</td> </tr> <tr> <td></td> <td></td> <td>LS ✓A</td> <td>NT</td> <td>→ SP; LS; NT</td> </tr> <tr> <td></td> <td>SP</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>T ✓A</td> <td>→ SP; SS; T ✓CA</td> </tr> <tr> <td></td> <td></td> <td>SS</td> <td>NT</td> <td>→ SP; SS; NT</td> </tr> </table> <p>1A LS and SS 2A T and NT</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>4A POSSIBLE OUTCOMES Max 1 mark if only 1 or 2 possible outcomes are correct Max 2 marks if 3 or 4 possible outcomes are correct Max 3 marks if 5 or 6 possible outcomes are correct Max 4 marks if all 7 possible outcomes are correct</p> </div> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Order of outcomes not important in this solution</p> </div> <p style="text-align: right;">(7)</p> </div>		PANTS	SHIRT	TIE	POSSIBLE OUTCOMES				T	→ LP; LS; T			LS	NT	→ LP; LS; NT ✓CA		LP							T ✓A	→ LP; SS; T ✓CA			SS	NT	→ LP; SS; NT									T	→ SP; LS; T ✓CA			LS ✓A	NT	→ SP; LS; NT		SP							T ✓A	→ SP; SS; T ✓CA			SS	NT	→ SP; SS; NT	<p>12.4.5</p>	<p>12.4.5</p>
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			T ✓A	→ SP; SS; T ✓CA																																																											
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2.2.2	$P(\text{correct uniform}) = \frac{2}{8} \checkmark A \quad \text{OR} \quad \frac{1}{4}$ $= 0,25 \checkmark CA$	<p>1A number of actual outcomes (numerator) 1A number of possible outcomes (denominator) 1CA decimal form</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Max 2 marks if $\frac{1}{4}$ or 25%</p> </div> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Answer only full marks</p> </div> <p style="text-align: right;">(3)</p>	<p>12.4.5</p>																																																												

QUESTION 3 [38 MARKS]			
No penalty for rounding off			
Ques	Solution	Explanation	ASs
3.1.1	<p>Monthly medical aid costs $\checkmark M \quad \checkmark RT$ $= R1\ 152 + R816 + 2 \times R424$ $= R2\ 816 \checkmark CA$</p> <p>Member's contribution = $\frac{1}{3} \times R2\ 816 \checkmark CA$ $= R938,67 \checkmark CA$</p> <p style="text-align: center;">OR</p> <p>Member's contribution $\checkmark CA \quad \checkmark M \quad \checkmark RT$ $= \frac{1}{3} (R1\ 152 + R816 + 2 \times R424)$ $= \frac{1}{3} \times R2\ 816 \checkmark A$ $= R\ 938,67 \checkmark CA$</p> <p style="text-align: center;">OR</p> <p>Members subscription = $\frac{1}{3} \times R1\ 152 = R\ 384$ $\checkmark A \quad \checkmark M \quad \checkmark RT$</p> <p>Wife's subscription = $\frac{1}{3} \times R816 = R272$</p> <p>Children subscriptions = $2 \times \frac{1}{3} \times R424 = R282,67 \checkmark CA$</p> <p>Member's contribution = $R\ 384 + R272 + R282,67$ $= R\ 938,67 \checkmark CA$</p>	<p>1M correct main member from table 1RT cost for wife and children 1CA total cost of the three categories 1A multiplying correct value by $\frac{1}{3}$ 1CA simplifying</p> <p>1M correct main member from table 1RT cost for wife and children 1CA total cost 1A multiplying correct value by $\frac{1}{3}$ 1CA simplifying</p> <p>1M correct main member from table 1A multiplying correct value by $\frac{1}{3}$ 1RT cost for wife and children 1CA children cost 1CA simplifying</p>	12.1.3
		Max 4 marks if incorrect row used	
		Answer only full marks	
			(5)

Ques	Solution	Explanation ASs																		
3.1.2 (a)	<p style="text-align: center;">ANNEXURE D</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;"></th> <th style="width: 35%; text-align: left;">MONTHLY DEDUCTIONS</th> <th style="width: 60%; text-align: center;">3.1.2 (a)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">A</td> <td>Union membership</td> <td style="text-align: right;">R35,00</td> </tr> <tr> <td style="text-align: center;">B</td> <td>Pension = 7,5% of gross salary</td> <td style="text-align: right;">$7,5\% \times R7\ 986,50 = \underline{\underline{R598,99}}$ ✓M ✓A</td> </tr> <tr> <td style="text-align: center;">C</td> <td>PAYE = (gross salary – R4 750) × 18%</td> <td style="text-align: right;">$(R7\ 986,50 - R4\ 750,00) \times 18\% = R3\ 236,50 \times 0,18 = \underline{\underline{R582,57}}$ ✓SF ✓CA</td> </tr> <tr> <td style="text-align: center;">D</td> <td>Medical Aid contribution</td> <td style="text-align: right;">R938,67</td> </tr> <tr> <td style="text-align: center;">E</td> <td>Total = A + B + C + D</td> <td style="text-align: right;">Total deductions = R35 + R598,99 + R582,57 + R938,67 = <u><u>R2 155,23</u></u> ✓CA</td> </tr> </tbody> </table>		MONTHLY DEDUCTIONS	3.1.2 (a)	A	Union membership	R35,00	B	Pension = 7,5% of gross salary	$7,5\% \times R7\ 986,50 = \underline{\underline{R598,99}}$ ✓M ✓A	C	PAYE = (gross salary – R4 750) × 18%	$(R7\ 986,50 - R4\ 750,00) \times 18\% = R3\ 236,50 \times 0,18 = \underline{\underline{R582,57}}$ ✓SF ✓CA	D	Medical Aid contribution	R938,67	E	Total = A + B + C + D	Total deductions = R35 + R598,99 + R582,57 + R938,67 = <u><u>R2 155,23</u></u> ✓CA	<p>12.1.3 12.2.3</p> <p>1M multiplying 1A simplifying</p> <p>1SF substitution into formula</p> <p>1CA simplifying</p> <p>1CA total</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">No penalty for rounding off</div> <p style="text-align: right;">(5)</p>
	MONTHLY DEDUCTIONS	3.1.2 (a)																		
A	Union membership	R35,00																		
B	Pension = 7,5% of gross salary	$7,5\% \times R7\ 986,50 = \underline{\underline{R598,99}}$ ✓M ✓A																		
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D	Medical Aid contribution	R938,67																		
E	Total = A + B + C + D	Total deductions = R35 + R598,99 + R582,57 + R938,67 = <u><u>R2 155,23</u></u> ✓CA																		
3.1.2 (b)	<p>Net salary = Gross salary – total deductions = R7 986,50 – R2 155,23 ✓M = R5 831,27 ✓CA</p> <p>Net annual salary = R5 831,27 × 12 = R69 975,24 ✓CA</p>	<p>1M difference of correct values 1CA simplifying</p> <p>1CA annual net salary</p> <p style="text-align: right;">(3)</p>																		

Ques	Solution		Explanation ASs	
3.1.3 (a)	ANNEXURE E		12.1.3 12.2.3	
		MONTHLY DEDUCTIONS	3.1.3(a)	
	A	Union membership	R35,00	
	B	Pension = 7,5% of gross salary	New salary $\checkmark A$ = $1,045 \times R7\,986,50 = R8\,345,89$ $\checkmark CA$ Pension = $7,5\% \times R8\,345,89 = \underline{R625,94}$ $\checkmark CA$	1A increase in % 1CA new salary 1CA simplifying
	C	PAYE = (gross salary – R4 750) \times 18%	$(R8\,345,89 - R4\,750,00) \times 18\%$ = $R3\,595,89 \times 0,18 = \underline{R647,26}$ $\checkmark CA$	1CA simplifying
	D	Medical Aid contribution	Medical Aid cost $\checkmark RT$ = $R1\,256 + R900 + 2 \times R468$ = $R3\,092$ $\checkmark A$ Member contribution $\checkmark CA$ = $\frac{1}{3} \times R3\,092 = \underline{R1\,030,67}$	1RT values 1A medical aid costs 1CA simplifying
	E	Total = A + B + C + D	Total deductions = $R35 + R625,94 + R647,26$ + $R1\,030,67$ = $R2\,338,87$ $\checkmark CA$	1CA total deductions
Net salary = $R8\,345,89 - R2\,338,87$ = $R6\,007,02$ $\checkmark CA$		1CA simplifying		
Difference in net salaries = $R6\,007,02 - R5\,831,27 = \underline{R175,75}$ $\checkmark CA$		1CA conclusion		
\therefore Mr Riet's argument is NOT valid.		No penalty for rounding off		

(10)

Ques	Solution	Explanation	ASs
3.1.3(b)	$\% \text{ change} = \frac{\overset{\check{CA}}{R72\,084,24} - \overset{\check{M}}{R69\,975,24}}{R69\,975,24} \times 100\%$ $= 3,013\%$ $\approx 3,01\% \quad \check{CA}$ <p style="text-align: center;">OR</p> $\% \text{ change} = \frac{\overset{\check{M}}{R6\,007,02} - \overset{\check{CA}}{R5\,831,27}}{R5\,831,27} \times 100\%$ $= 3,013\%$ $\approx 3,01\% \quad \check{CA}$	<p>1M calculating % change 1CA using new and old salary</p> <p>1CA simplifying</p> <p>1M calculating % change 1CA using new and old salary</p> <p>1CA simplifying</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> No penalty for leaving out % symbol Accept 0,0301 </div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto; text-align: center;"> Answer only full marks </div> <p style="text-align: right;">(3)</p>	12.1.3
3.2.1	<p>2009/2010 = 17% of R834,3 billion \check{M} = $0,17 \times R834,3$ billion = R141,831 billion \check{A}</p> <p>2010/2011 = 18% of R900,9 billion \check{M} = $0,18 \times R900,9$ billion = R162,162 billion \check{CA}</p> <p>Difference = $R162,162$ billion – $R141,831$ billion \check{M} = R20,331 billion \check{CA} = R20 331 000 000 \check{C}</p> <p>R20 331 000 000 > R20 000 000 000</p>	<p>1M calculating 17%</p> <p>1A simplifying</p> <p>1A percentage expenditure in 2010/2011 1M calculating 18% 1CA simplifying</p> <p>1M calculating the difference</p> <p>1CA difference in rand 1C conversion</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> Numbers may be written with zeros instead of the word billion </div> <p style="text-align: right;">(8)</p>	12.1.1 12.4.4

Ques	Solution	Explanation	ASs
3.2.2	<ul style="list-style-type: none"> * Increases in number of employees * Increase in salaries * Building new schools/libraries * Increase in the number of “no fee” schools * Teacher development initiatives * Increase in expenditure per learner * Demands of the new curriculum * Cater for inflation * Free stationery and textbooks * Feeding scheme for all learners * Free transport for all learners * More money for bursaries ✓✓ O ✓✓ O * Improvement of matric results * Demand for Higher Education 	<p>2O any correct reason</p> <p>2O any correct reason</p> <p style="text-align: right;">(4)</p>	12.4.4

QUESTION 4 [28 MARKS]			
Ques	Solution	Explanation	AS
4.1	$\text{Height of bottle} = \frac{143 \text{ mm}}{102\%}$ $= \frac{143 \text{ mm}}{1,02}$ $= 140,196\dots \text{ mm}$ $\approx 140 \text{ mm}$	<p>✓ A ✓ M</p> <p>OR $\frac{143 \text{ mm}}{102\%} \times 100\%$</p> <p>1CA/R simplifying to nearest mm</p> <p><input type="checkbox"/> ax 1 for rounding off if method is incorrect</p> <p>Answer only full marks</p> <p>(3)</p>	12.1.1 12.3.1

Ques	Solution	Explanation	AS
4.2	$\begin{aligned} \text{Area of base of bottle} &= 3,14 \times (29 \text{ mm})^2 \quad \checkmark \text{ SF} \\ &= 2\,640,74 \text{ mm}^2 \quad \checkmark \text{ CA} \end{aligned}$ <p>Length of base of box</p> $= 105\% \times 58 \text{ mm} \quad \checkmark \text{ M}$ $= 1,05 \times 58 \text{ mm}$ $= 60,9 \text{ mm} \quad \checkmark \text{ A}$ <p>Area of base of box = (side length)²</p> $= (60,9 \text{ mm})^2 \quad \checkmark \text{ SF}$ $= 3\,708,81 \text{ mm}^2 \quad \checkmark \text{ CA}$ <p>Difference in area = $3\,708,81 \text{ mm}^2 - 2\,640,74 \text{ mm}^2$ $\checkmark \text{ M}$</p> $= 1\,068,07 \text{ mm}^2 \quad \checkmark \text{ CA}$ $\approx 10,68 \text{ cm}^2$ <p>The dimensions satisfy the guideline $\checkmark \checkmark \text{ CA}$</p>	<p>1SF substitution into correct formula 1A value of radius 1CA simplifying</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>2642,08 using pi 2643,14 using $\frac{22}{7}$</p> </div> <p>1M increasing percentage 1A simplifying</p> <p>1SF substitution into formula 1CA simplifying 1M subtracting 1CA simplifying</p> <p>2CA conclusion</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>Length of base rounded off to 61 mm, or use of $\text{pi}/\frac{22}{7}$ the difference in area = $10,80 \text{ cm}^2$</p> <p>Answer can be calculated using cm.</p> </div> <p style="text-align: right;">(11)</p>	12.3.1 12.1.1

Ques	Solution	Explanation	AS
4.3.1	<p>Area A = $143 \text{ mm} \times 60,9 \text{ mm}$ ✓ M $= 8\,708,7 \text{ mm}^2$ ✓ CA</p> <p>Area B = $(60,9 \text{ mm})^2$ $= 3\,708,81 \text{ mm}^2$ ✓ CA</p> <p>Area C = $\frac{1}{2} \times 3,14 \times \left(\frac{60,9 \text{ mm}}{2}\right)^2$ ✓ SF $= \frac{1}{2} \times 2\,911,41585 \text{ mm}^2$ $= 1\,455,71 \text{ mm}^2$ ✓ CA</p> <p>Area of open box $= 4(A + D) + 2(B + C) + E$ $= 4(8\,708,7 + 1\,832) \text{ mm}^2 + 2(3\,708,81 + 1\,455,71) \text{ mm}^2$ ✓ SF $+ 2\,855 \text{ mm}^2$ $= 55\,346,84 \text{ mm}^2$ ✓ CA $= \frac{55\,346,84}{1\,000\,000} \text{ m}^2$ ✓ C $= 0,055346\dots\text{m}^2$</p> <p>Mass of box = $240 \text{ g/m}^2 \times \frac{55\,346,84}{1\,000\,000} \text{ m}^2$ ✓ M $= 13,2832\dots \text{ g}$ ✓ S $= 14 \text{ g}$ ✓ R</p> <p style="text-align: center;">OR</p>	<p>1M calculating area 1CA simplifying</p> <p>1CA area B</p> <p>1SF substitution into correct formula</p> <p>1CA simplifying</p> <p>1SF(CA) substitution</p> <p>1CA simplifying</p> <p>1C converting to m^2</p> <p>1M multiplication</p> <p>1S simplifying</p> <p>1R rounding</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">accept 13 g</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">If area rounded off to $0,06 \text{ m}^2$ then mass = 15 g</div>	12.3.1

Ques	Solution	Explanation	ASs
4.3.1 (cont)	<p>Area A = $143 \text{ mm} \times 61 \text{ mm}$ ✓ SF $= 8\,723 \text{ mm}^2$ ✓ CA</p> <p>Area B = $61 \text{ mm} \times 61 \text{ mm}$ $= 3\,721 \text{ mm}^2$ ✓ CA</p> <p>Area C = $\frac{1}{2} \times 3,14 \times \left(\frac{61 \text{ mm}}{2}\right)^2$ ✓ SF $= \frac{1}{2} \times 2\,920,985 \text{ mm}^2$ $= 1\,460,49 \text{ mm}^2$ ✓ CA</p> <p>Surface area $= 4(A + D) + 2(B + C) + E$ ✓ SF $= 4(8\,723 + 1\,832) \text{ mm}^2 + 2(3\,721 + 1\,460,49) \text{ mm}^2 + 2\,855 \text{ mm}^2$ $= 55\,437,98 \text{ mm}^2$ $= \frac{55\,437,98}{1\,000\,000} \text{ m}^2$ ✓ C $= 0,055.. \text{m}^2$</p> <p>Mass of box = $240 \text{ g/m}^2 \times 0,055..$ ✓ M $= 13,31 \text{ g}$ ✓ S $= 14 \text{ g}$ ✓ R</p>	<p>1SF substitution 1CA area A</p> <p>1CA area B</p> <p>1SF substitution 1CA area C</p> <p>1SF substitution 1CA surface area 1C converting to m^2</p> <p>1M multiplication 1S simplification 1R rounding</p> <p>(11)</p>	12.3.1
4.3.2	<p>1 kg = 1 000 g $\therefore 14 \text{ g} = 0,014 \text{ kg}$ ✓ C</p> <p>Cost = $\text{R } 16,00 + 0,014 \text{ kg} \times \text{R } 20 \text{ per kg}$ ✓ SF $= \text{R}16,00 + \text{R}0,28$ $= \text{R}16,28$ ✓ CA</p>	<p>1C converting to kg 1SF substitution of answer from 4.3.1 into the correct formula 1CA simplifying</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>Accept R16,26 to R16,30</p> </div> <p>(3)</p>	12.2.3 12.3.2

QUESTION 5 [30 MARKS]			
Ques	Solution	Explanation	AS
5.1.1(a)	July and August ✓A ✓A	2A July and August <div style="border: 1px solid black; padding: 2px; display: inline-block;"> June and July 1 mark August and Sept 1 mark </div> (2)	12.4.4
5.1.1(b)	February; ✓A May; ✓A September; December	1 A two months 1 A two months <div style="border: 1px solid black; padding: 2px; display: inline-block;"> Penalty of 1 mark if more than four months </div> (2)	12.4.4
5.1.1(c)	October and November ✓A ✓A	2A October and November <div style="border: 1px solid black; padding: 2px; display: inline-block;"> Sept and Oct 1 mark Nov and Dec 1 mark </div> (2)	12.4.4
5.1.2(a)	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> Interpretation as % difference: </div> $\begin{aligned} \text{Percentage change} &= -4,1\% - 3,9\% \quad \checkmark\text{RG} \quad \checkmark\text{M} \\ &= -8\% \quad \checkmark\text{CA} \end{aligned}$ <p style="text-align: center;">OR</p> $\begin{aligned} \text{Percentage change} &= 3,9\% - (-4,1\%) \quad \checkmark\text{RG} \quad \checkmark\text{M} \\ &= 8\% \quad \checkmark\text{CA} \end{aligned}$ <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-top: 10px;"> Interpretation as % change: </div> $\begin{aligned} \text{Percentage change} &= \frac{-4,1 - 3,9}{3,9} \times 100\% \quad \checkmark\text{RG} \quad \checkmark\text{M} \\ &= -205,13\% \quad \checkmark\text{CA} \end{aligned}$	1RG reading from graph 1M subtracting 1CA simplifying <p style="text-align: center;">OR</p> 1RG reading from graph 1M subtracting 1CA simplifying <p style="text-align: center;">OR</p> 1RG reading from graph 1M calculating % 1CA simplifying <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-top: 10px;"> Answer only full marks </div> (3)	12.1.1

Ques	Solution	Explanation	ASs
5.1.2 (b)	$\text{Cost in May} = 92\% \times \text{R}150$ $= 0,92 \times \text{R}150$ $= \text{R}138$ <p style="text-align: center;">OR</p> $\text{Cost in May} = \text{R}150 - 8\% \text{ of } \text{R}150$ $= \text{R}150 - 0,08 \times \text{R}150$ $= \text{R}138$	1CA percentage 1M calculating cost 1CA simplifying 1CA percentage 1M calculating cost 1CA simplifying <div style="border: 1px solid black; padding: 2px; display: inline-block;">Answer only full marks</div> (3)	12.1.3
5.2.1	$\text{Price of bicycle} \times 105,8\% = \text{R}1\,586,95$ $\text{Price of bicycle} = \frac{\text{R}1\,586,95}{105,8\%}$ $= \frac{\text{R}1\,586,95}{1,058}$ $= \text{R}1\,499,95$ <p style="text-align: center;">OR</p> $\text{Price of bicycle: } x + 5,8\% \text{ of } x = \text{R}1\,586,95$ $1,058x = \text{R}1\,586,95$ $x = \text{R}1\,499,95$	1M dividing 1A using correct values 1CA simplifying 1M use of equation 1A using correct values 1CA simplifying (3)	12.1.3
5.2.2	$A = P(1 + i)^n$ $= \text{R}5,45(1 + 0,058)^6$ $= \text{R}7,64$	1SF substitution of P 1A value of i 1A value of n 1CA simplifying <div style="border: 1px solid black; padding: 2px; display: inline-block;">No penalty for rounding</div> <div style="border: 1px solid black; padding: 2px; display: inline-block;">Answer only full marks</div> (4)	12.1.3

Ques	Solution	Explanation	AS
5.3.1	<p style="text-align: center;">BASKET OF FRUIT: MONTH-ON-MONTH CHANGES (2008)</p> <p style="text-align: center;">Percentage change in price</p> <p style="text-align: center;">Months</p>		
	<p>4A all points plotted correctly (1A for every three points plotted correctly) 1CA horizontal line between July and August 2CA joining point with straight lines</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>Maximum of 4 marks if bar graph drawn correctly Maximum of 5 marks for correct shape but incorrect scale</p> </div>		12.2.2
			(7)

Ques	Solution	Explanation	AS
5.3.2(a)	<p>The graphs show a similar trend of month-on-month changes in prices as follows:</p> <p>An increase from May to November OR A decrease from January to February; OR A decrease from April to May; OR An increase from May to July; OR An increase from May to August; OR Zero change from July to August OR An increase from September to November OR A decrease from November to December. OR NO trend from January to December ✓CA ✓CA</p>	<p>2 CA for the trend</p> <p>(2)</p>	12.4.4
5.3.2(b)	<p>Prices are generally high in December and ^{✓✓O}January due to festive season, and tend to drop in February. OR Prices tend to increase in the winter months (May, June, July) as fruit becomes scarce. OR Valid reasons like: Political reason; economic; climatic; religious; no trend-fluctuations</p>	<p>2O Own opinion that is valid for the trend chosen in 5.3.2(a)</p> <p>(2)</p>	12.4.4
TOTAL:			150