



# basic education

Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

## **NATIONAL SENIOR CERTIFICATE**

**GRADE 12**

**MATHEMATICAL LITERACY P2**

**FEBRUARY/MARCH 2013**

**MEMORANDUM**

**MARKS: 150**

<b>Symbol</b>	<b>Explanation</b>
M	Method
M/A	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG	Reading from a table/Reading from a graph
SF	Correct substitution in a formula
O	Opinion/Example
P	Penalty, e.g. for no units, incorrect rounding off etc.
R	Rounding off

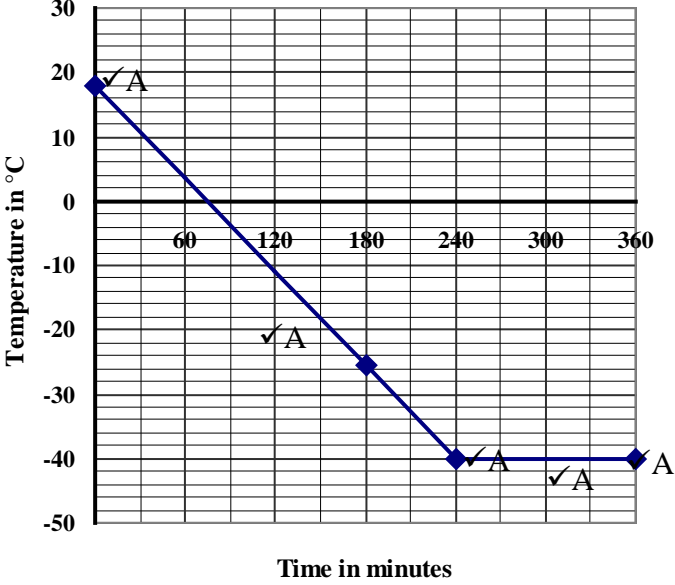
**This memorandum consists of 17 pages.**

<b>QUESTION 1 [24 MARKS]</b>			
<b>Ques</b>	<b>Solution</b>	<b>Explanation</b>	<b>AS</b>
1.1.1 (a)	$7\frac{1}{2} \quad 8 \quad 8\frac{1}{2} \quad 8\frac{1}{2} \quad 9 \quad 9 \quad 9 \quad 9 \quad 9\frac{1}{2}$ <p style="text-align: right;">✓M</p> <p>The median score = 9 ✓✓A</p>	<p>1M arranging in order</p> <hr/> <p>2A correct identification</p> <hr/> <p><b>Answer only full marks</b></p> <p style="text-align: right;">(3)</p>	12.4.3 L3
1.1.1 (b)	<p>Range = <math>9\frac{1}{2} - 7\frac{1}{2}</math> ✓M</p> <p style="padding-left: 40px;">= 2 ✓A</p>	<p>1M subtraction</p> <p>1A simplification</p> <hr/> <p><b>Answer only full marks</b></p> <p style="text-align: right;">(2)</p>	12.4.3 L2
1.1.2 (a)	<p>To eliminate scores of judges who are biased. ✓✓O</p> <p><b>OR</b></p> <p>Eliminating the highest and lowest scores will have the effect that the mean is calculated without extreme values ✓✓O</p> <p><b>OR</b></p> <p>Any other valid, well-thoughtout opinion</p>	<p>2O opinion</p> <p><b>OR</b></p> <p>2O opinion</p> <p style="text-align: right;">(2)</p>	12.4.4 L4
1.1.2 (b)	<p>Bongani's mean = <math>\frac{9+8+9+9+9+8\frac{1}{2}+8\frac{1}{2}}{7}</math> ✓M</p> <p style="padding-left: 40px;">= <math>\frac{61}{7}</math> ✓A</p> <p style="padding-left: 40px;">= 8,714...</p> <p style="padding-left: 40px;">= 8,71 ✓CA</p> <p>Graham's mean = <math>\frac{9+9+7\frac{1}{2}+8+8\frac{1}{2}+9+9}{7}</math> ✓A</p> <p style="padding-left: 40px;">= <math>\frac{60}{7}</math> ✓A</p> <p style="padding-left: 40px;">= 8,5714...</p> <p style="padding-left: 40px;">= 8,57 ✓CA</p> <p>∴ Bongani attained the higher mean score ✓CA</p>	<p>1M concept of mean</p> <p>1A correct numerator</p> <p>1A correct denominator</p> <p>1CA simplification</p> <p>1A correct numerator</p> <p>1A concept of mean</p> <p>1CA simplification</p> <p>1CA conclusion</p> <p style="text-align: right;">(8)</p>	12.4.3 L4

Ques	Solution	Explanation	AS
1.2.1	<p>Total points scored</p> $= (20 \times \mathbf{g}) + (10 \times \mathbf{s}) + (5 \times \mathbf{b}) \checkmark \checkmark \mathbf{M}$ <p style="text-align: center;"><math>\checkmark \mathbf{A}</math></p> <p><b>OR</b></p> $= (20 \times \mathbf{g}) + (10 \times \mathbf{s}) + \left(\frac{1}{2} \times 10 \times \mathbf{b}\right) \checkmark \checkmark \mathbf{M}$ <p style="text-align: center;"><math>\checkmark \mathbf{A}</math></p>	<p>1A correct values 2M adding and multiplying</p> <p><b>OR</b></p> <p>1A correct values 2M adding and multiplying</p> <p style="text-align: right;">(3)</p>	12.2.1 L2
1.2.2	<p>Total points scored by China</p> $= 20(9) + 10(3) + 5(11) \checkmark \mathbf{M}$ $= 265 \checkmark \mathbf{A}$ <p>Total points scored by Australia</p> $= 20(8) + 10(5) + 5(10)$ $= 260 \checkmark \mathbf{A}$ <p>Total points scored by South Africa</p> $= 20(5) + 10(15) + 5(3)$ $= 265 \checkmark \mathbf{A}$ <p>Although South Africa and China had an equal number of points, China performed the best because they had more gold medals. <math>\checkmark \checkmark \mathbf{O}</math></p> <p><b>OR</b></p> <p>Any other well-thoughtout opinion</p>	<p>1M substitution 1A simplification</p> <p>1A simplification</p> <p>1A simplification</p> <p>2O conclusion</p> <p style="text-align: right;">(6)</p>	12.2.1 12.4.1 L3 (4) L4 (2)
			<b>[24]</b>

<b>QUESTION 2 [30 MARKS]</b>			
<b>Ques</b>	<b>Solution</b>	<b>Explanation</b>	<b>AS</b>
2.1.1	$800 \text{ km} = 500 \text{ miles} \checkmark A$ $2\,798 \text{ km} = \frac{500 \times 2\,798}{800} \text{ miles} \checkmark C$ $= 1\,748,75 \text{ miles} \checkmark CA$ <b>OR</b> $l = \text{the length of South African coastline}$ $\frac{2\,798}{800} = \frac{l}{500} \checkmark M$ $l = \frac{500 \times 2\,798}{800} \checkmark M$ $l = 1\,748,75 \text{ miles} \checkmark CA$ <b>OR</b> $800 \text{ km} = 500 \text{ miles}$ So $1 \text{ km} = \frac{500}{800} \text{ miles} \checkmark M$ $\therefore 2\,798 \text{ km} = \frac{500}{800} \times 2\,798 \text{ miles} \checkmark C$ $= 1\,748,75 \text{ miles} \checkmark CA$	$1A$ equating distances $1C$ correct conversion $1CA$ simplification <b>OR</b> $1M$ concept  $1M$ manipulation $1CA$ simplification <b>OR</b> $1M$ concept  $1C$ conversion $1CA$ simplification <b>Answer only full marks</b> (3)	12.1.1 L3
2.1.2	$\checkmark A$ $\checkmark \checkmark M$ Western Cape, Eastern Cape, Kwazulu Natal, Northern Cape	$1A$ naming the coastal provinces $2M$ correct order (3)	12.3.1 L4
2.1.3	$223 \text{ mm on the map represents } 2\,798 \text{ km} \checkmark C$ $223 \text{ mm on the map represents } 2\,798\,000\,000 \text{ mm} \checkmark C$ $1 \text{ mm on the map represents } \frac{2\,798\,000\,000\,000}{223}$ $= 12\,547\,085,2 \text{ mm} \checkmark S$  Scale is $1: 12\,500\,000 \checkmark R$	$1C$ correct conversion values $1C$ conversion  $1S$ simplification  $1R$ rounding <b>Answer only full marks</b> (4)	12.3.3 L3
2.2.1	$\checkmark A$ $\checkmark A$ $\text{Crew} = (3 \times 10) + 14 + (2 \times 22)$ $= 88 \checkmark CA$	$1A$ ski-boat crew $1A$ medium freezer crew $1CA$ simplification (3)	12.2.1(2) 12.1.1(1) L3

Ques	Solution	Explanation	AS
2.2.2	Number of extra crew members = $102 - 88 \checkmark M$ $= 14 \checkmark CA$ $\checkmark \checkmark J$ He should buy one Small freezer boat as he can operate it with a maximum of 14 crew members.	1M difference 1CA simplification  2J correct boat (4)	12.1.1 (1) 12.2.1 (3) L3 (1) L4 (3)
2.3.1	$\text{Temperature in } ^\circ\text{C} = 18 - \left( 14,5 \times \frac{\text{time in minutes}}{60} \right)$ $D = 18 - \left( 14,5 \times \frac{120}{60} \right) \checkmark SF$ $= 18 - 29$ $= -11 \checkmark CA$ $\text{Temperature in } ^\circ\text{C} = 18 - \left( 14,5 \times \frac{\text{time in minutes}}{60} \right)$ $0 = 18 - \left( 14,5 \times \frac{E}{60} \right) \checkmark SF$ $14,5 \times \frac{E}{60} = 18$ $0,24166... \times E = 18 \quad \text{OR} \quad E = \frac{18 \times 60}{14,5} \checkmark M$ $E = \frac{18}{0,24166...} \checkmark M \quad E = 74,482...$ $E = 74,482... \quad E \approx 74,48 \text{ minutes} \checkmark CA$ $E \approx 74,48 \text{ minutes} \checkmark CA$	 1SF substituting  1CA value of D  1SF substituting  1M making E the subject  1CA value of E <hr/> <b>Answer only full marks</b> (5)	12.2.1 L2 (2) L3 (3)

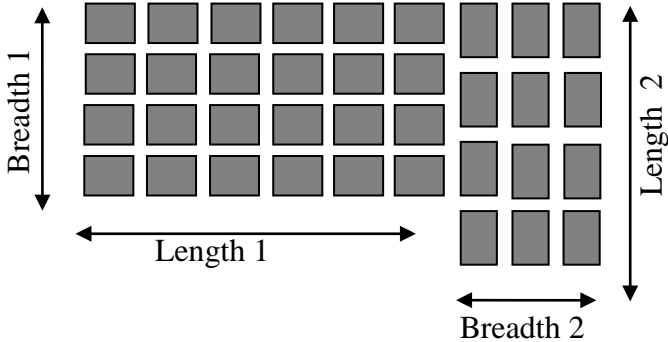
Ques	Solution	Explanation	AS
2.3.2	<p style="text-align: center;"><b>TEMPERATURE AND TIME GRAPH</b></p>  <p style="text-align: center;"><b>Temperature in °C</b></p> <p style="text-align: center;"><b>Time in minutes</b></p>	<p>1A plotting (0;20) 1A plotting (240;-40) 1A plotting (360;-40)</p> <p>1A joining points with a straight line</p> <p>1A horizontal line</p> <p style="text-align: right;">(5)</p>	12.2.2 L3(4) L4(1)
2.3.3	<p>Cooling rate = 14,5 °C per hour = 14,5 °C per 60 minutes ✓C = 2,4166... °C per 10 minutes ✓M ≈ 2,42 °C per 10 minutes</p> <p><b>YES</b> the claim is valid. ✓CA</p> <p style="text-align: center;"><b>OR</b></p> <p>Cooling rate = <math>\frac{14,5^\circ\text{C}}{60\text{ min}} \times 10\text{ min}</math> ✓M = 2,41666 °C per 10 minutes ✓CA</p> <p><b>YES</b> the claim is valid. ✓CA</p>	<p>1C converting to minutes 1M dividing by 6</p> <p>1CA conclusion</p> <p>1M finding the rate 1CA simplification</p> <p>1CA conclusion</p> <p style="text-align: right;">(3)</p>	12.2.3 L4
			<b>[30]</b>

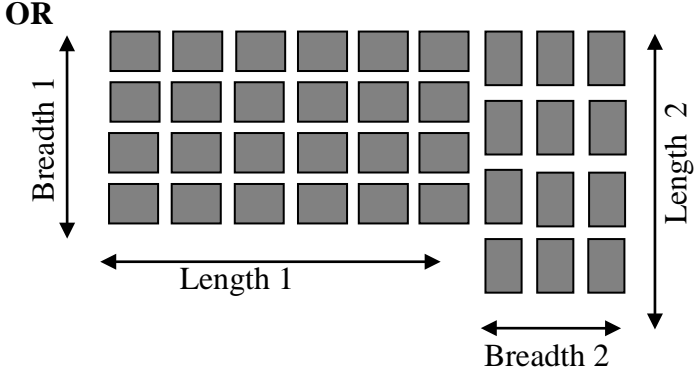
<b>QUESTION 3 [31 MARKS]</b>				
<b>Ques</b>	<b>Solution</b>	<b>Explanation</b>	<b>AS</b>	
3.1.1	$x = \frac{98 - 26}{2} \checkmark M$ $= 36 \checkmark M$ <p style="text-align: center;"><b>OR</b></p> $y = 16 + 8 + \frac{1}{3}(36)$ $= 36$	$26 + x + x = 98 \checkmark M$ $2x = 72$ $x = 36 \checkmark CA$ <p style="text-align: center;"><b>OR</b></p> $\frac{1}{3} \times 36 = 12 \checkmark CA$ $y = 16 + 8 + 12$ $= 36 \checkmark CA$	1M finding the total 1CA value of x 1CA calculating $\frac{1}{3}$ 1CA value y <hr/> <b>Answer only full marks</b> (4)	12.4.4(1) 12.2.1(3) L3
3.1.2	Ms Nana could have calculated her scores incorrectly $\checkmark O$ $\checkmark O$ <p style="text-align: center;"><b>OR</b></p> One of the learners was absent and did not complete and submit the questionnaire. $\checkmark O \checkmark O$ <p style="text-align: center;"><b>OR</b></p> Any other valid reason	2O reason	(2)	12.4.4 L4
3.2.1	Cost (in rand) = $m \times (375 + 150) \checkmark A$ <p style="text-align: center;"><b>OR</b></p> Cost (in rand) = $m \times (525) \checkmark A$	2 A equation	(2)	12.2.1 L4
3.2.2	There are seven learners under 18 years old. $\checkmark A$ This would mean that 4 family rooms can be booked. Four family rooms could accommodate 16 people in total. $\checkmark CA$ The teacher can book one twin room since the teacher will not share a room. $\checkmark CA$ Minimum number of rooms needed is 4 family rooms and 1 twin room. $\checkmark CA$	1A counting 1CA total number of people in the family rooms. 1CA recognising 1 twin room for the teacher 1CA minimum number of rooms.	(4)	12.2.1 L4

Ques	Solution	Explanation	AS
3.2.3	<p>Cost per night for one twin room = <math>1 \times (R375 + R150) \checkmark M</math> = R525 <math>\checkmark A</math></p> <p>Cost per night for four family rooms = <math>4 \times R679 \checkmark M</math> = R2 716 <math>\checkmark A</math></p> <p>Cost per night for accomodation = R525 + R2 716 = R3 241 <math>\checkmark CA</math></p> <p>Total cost for two nights = <math>R3 241 \times 2</math> = R6 482 <math>\checkmark CA</math></p> <p>Cost per person = <math>\frac{\checkmark M R6482}{16} \approx R405,13 \checkmark CA</math></p> <p>Mrs Suzman estimation is <b>INCORRECT.</b> <math>\checkmark C</math></p> <p><b>OR</b></p> <p>Total cost for two nights <math>\checkmark CA \checkmark CA \checkmark \checkmark A \checkmark \checkmark M</math> = <math>2 \times [4 \times R679 + 1 \times (R375 + R150)]</math> = R6 482</p> <p>Cost per person = <math>\frac{\checkmark M R6482}{16} \approx R405,13 \checkmark CA</math></p> <p>Mrs Suzman's estimation is <b>INCORRECT.</b> <math>\checkmark C</math></p>	<p>1M concept 1A cost of one twin room per night 1M concept 1A cost of four family rooms per night</p> <p>1CA accommodation cost per night</p> <p>1CA cost per two nights 1M dividing 1CA simplification 1C conclusion</p> <p><b>OR</b></p> <p>2M formula 2A use of correct values 1CA for two nights 1CA simplification</p> <p>1M dividing 1CA simplification 1C conclusion</p>	<p>12.1.1(5) 12.2.1(4) L3(2) L4(7)</p> <p>(9)</p>
3.3.1	B2 $\checkmark \checkmark A$	2A grid reference (2)	12.3.4 L2
3.3.2	North West $\checkmark \checkmark A$	2A direction (2)	12.3.4 L3
3.3.3	Hamilton Street $\checkmark \checkmark A$	2A answer (2)	12.3.3 L2



Ques	Solution	Explanation	AS
3.3.4	<p>From the Hotel, turn left into Proes St. ✓A            At the intersection of Proes and Beatrix St, turn right into Beatrix St. ✓A            Continue on Beatrix St, which later becomes Voortrekkers St            Travel until the intersection of Voortrekkers and Jacobs St. ✓A            Turn right into Jacobs Street and right into Tenth Ave. ✓A</p> <p><b>OR</b></p> <p><b>WITH THE NEW STREET NAMES:</b>            From the Hotel, turn left into Johannes Ramohoase St. ✓A            At the intersection of Johannes Ramohoase St. and Steve Biko St, turn right into Steve Biko St. ✓A            Travel until the intersection of Steve Biko St. and Jacob St. ✓A            Turn right into Jacobs Street and right into Tenth Ave. ✓A</p>	<p>1A correct direction from the hotel            1A Beatrix St</p> <p>1A Voortrekkers and Jacob St.            1A Jacobs St and Tenth Av.</p> <p><b>OR</b></p> <p>1A correct direction from the hotel            1A Steve Biko St            1A Steve Biko St and Jacob St.            1A Jacobs St and Tenth Av.            (4)</p>	12.3.3 L3
			<b>[31]</b>

QUESTION 4 [29 MARKS]			
Ques	Solution	Explanation	AS
4.1.1	<p>Breadth of tent increased by 15%  <math>= 1,8 \text{ m} + (0,15 \times 1,8 \text{ m})</math> <b>OR</b> <math>1,8 \text{ m} \times 1,15</math> ✓M  <math>= 2,07 \text{ m}</math> ✓A</p> <p>Length of tent increased by 15%  <math>= 2,4 \text{ m} + 0,15 \times 2,4 \text{ m}</math> ✓M <b>OR</b> <math>2,4 \text{ m} \times 1,15</math>  <math>= 2,76 \text{ m}</math> ✓A</p> <p>Area needed for one tent <math>= 2,76 \text{ m} \times 2,07 \text{ m}</math> ✓M  <math>= 5,7132 \text{ m}^2</math> ✓CA</p> <p>Area needed for 36 tents <math>= 36 \times 5,7132 \text{ m}^2</math> ✓A  <math>= 205,6752 \text{ m}^2</math>  <math>\approx 205,68 \text{ m}^2</math> ✓CA</p> <p><b>OR</b></p>  <p>Breadth of tent increased by 15%  <math>= 1,8 \text{ m} + (0,15 \times 1,8 \text{ m})</math> <b>OR</b> <math>1,8 \text{ m} \times 1,15</math> ✓M  <math>= 2,07 \text{ m}</math> ✓A</p> <p>Length of tent increased by 15%  <math>= 2,4 \text{ m} + 0,15 \times 2,4 \text{ m}</math> <b>OR</b> <math>2,4 \text{ m} \times 1,15</math>  <math>= 2,76 \text{ m}</math> ✓A</p> <p>Area of camp site  <math>= [(6 \times 2,76 \text{ m}) + (4 \times 2,07 \text{ m})] + [(4 \times 2,76) \times (3 \times 2,07 \text{ m})]</math> ✓M ✓CA  <math>= 137,1168 \text{ m}^2 + 68,5584 \text{ m}^2</math> ✓CA  <math>= 205,6752 \text{ m}^2</math>  <math>\approx 205,68 \text{ m}^2</math> ✓CA</p>	<p>1M increased % 1A increased breadth</p> <p>1A increased length</p> <p>1M substitution 1CA simplification</p> <p>1A for the 36 1M multiplication 1CA simplification</p> <p>1M increased % 1A increased breadth</p> <p>1A increased length</p> <p>1M substitution 2CA use of correct values</p> <p>1CA simplification 1CA solution</p>	<p>12.3.1 L3 (4) L4 (4)</p>

Ques	Solution	Explanation	AS
	<p><b>OR</b></p>  <p>Breadth of tent increased by 15%  <math>= 1,8 \text{ m} + (0,15 \times 1,8 \text{ m})</math> <b>OR</b> <math>1,8 \text{ m} \times 1,15</math> ✓M  <math>= 2,07 \text{ m}</math> ✓A</p> <p>Length of tent increased by 15%  <math>= 2,4 \text{ m} + 0,15 \times 2,4 \text{ m}</math> <b>OR</b> <math>2,4 \text{ m} \times 1,15</math>  <math>= 2,76 \text{ m}</math> ✓A</p> <p>Breadth 1 = <math>4 \times 2,07 \text{ m} = 8,28 \text{ m}</math>                      Breadth 2 = <math>3 \times 2,07 \text{ m} = 6,21 \text{ m}</math> ✓CA</p> <p>Length 1 = <math>6 \times 2,76 \text{ m} = 16,56 \text{ m}</math> ✓CA                      Length 2 = <math>4 \times 2,76 \text{ m} = 11,04 \text{ m}</math> ✓CA</p> <p>Area of camp site  <math>= (16,56 \text{ m} \times 8,28 \text{ m}) + (11,04 \text{ m} \times 6,21 \text{ m})</math> ✓S  <math>= 137,1168 \text{ m}^2 + 68,5584 \text{ m}^2</math>  <math>= 205,6752 \text{ m}^2</math>  <math>= 205,68 \text{ m}^2</math> ✓CA</p>	<p><b>OR</b></p> <p>1M increased %                      1A increased breadth</p> <p>1A increased length</p> <p>1CA breadths</p> <p>2CA lengths</p> <p>1S substitution</p> <p>1CA simplification (8)</p>	
<p>4.1.2</p>	<p>The probability of it raining is very high. ✓✓O</p> <p><b>OR</b></p> <p>There is an 80% chance that it will rain. ✓✓O</p> <p><b>OR</b></p> <p>There is a 20% chance that it will not rain. ✓✓O</p>	<p>2O Opinion</p>	<p>12.4.5 L4</p> <p>(2)</p>

Ques	Solution	Explanation	AS
4.2	<p>Time spent on group activities on Day 1, 2, 3 and 4  <math>= 2 \text{ hours} + 2 \text{ hours } 15 \text{ min} + 2 \text{ hours} + 2 \text{ hours}</math>  <math>= 8 \text{ hours } 15 \text{ min} \quad \checkmark M</math></p> <p>Total time for first four days <math>= 4 \times (8 \text{ hours } 15 \text{ min})</math>  <math>= 33 \text{ hours} \quad \checkmark A</math></p> <p>Time spent on group activities on Day 5  <math>= 2 \text{ hours} + 2 \text{ hours } 15 \text{ min} + 2 \text{ hours}</math>  <math>= 6 \text{ hours } 15 \text{ min} \quad \checkmark A</math></p> <p>Total time spent on group activities  <math>= 33 \text{ hours} + 6 \text{ hours } 15 \text{ min}</math>  <math>= 39 \text{ hours } 15 \text{ min}</math>  <math>= 39,25 \text{ hours} \quad \checkmark CA</math></p> <p>Total time spent at the camp from 07:00 on Day 1 to 15:30 on Day 5  <math>= 4 \times 24 \text{ hours} + 8 \text{ hours } 30 \text{ min}</math>  <math>= 104 \text{ hours } 30 \text{ min}</math>  <math>= 104,5 \text{ hours} \quad \checkmark CA</math></p> <p>Percentage time spent on group activities  <math>= \frac{39,25}{104,5} \times 100\% \quad \checkmark M</math></p> $= 37,5598\dots\% \quad \checkmark CA$ $\approx 38\%$ $\therefore$ The teacher is not correct. $\checkmark C$	<p>1M adding time</p> <p>1A total time for four days</p> <p>1A time for day 5</p> <p>1CA total workshop time</p> <p>1CA total camp time</p> <p>1M calculating %</p> <p>1CA simplification</p> <p>1C conclusion</p> <p>(8)</p>	<p>12.1.1 (6) 12.3.2 (2) L4</p>
4.3.1	BEM means brown bread with egg and mayonnaise $\checkmark\checkmark A$	2A correct explanation (2)	12.4.5 L2
4.3.2	<p>The following should be found on the tree diagram:</p> <p>(a) WEN <math>\checkmark A</math>  (b) WFN <math>\checkmark A</math>  (c) HEM <math>\checkmark A</math>  (d) HFM <math>\checkmark A</math></p>	4A (1 for each correct outcome) (4)	12.4.5 L3

Ques	Solution	Explanation	AS
4.3.3 (a)	$\frac{1}{12}$ ✓A <b>OR</b> 0,08 ✓✓A <b>OR</b> 8,33 % ✓✓A	1A numerator 1A denominator (2)	12.4.5 L3
4.3.3 (b)	$\frac{8}{12}$ ✓A $= \frac{2}{3}$ <b>OR</b> 0,67 <b>OR</b> 66,67 % ✓CA  <b>OR</b>  $\frac{1}{3} = \frac{2}{3}$ ✓CA	1A numerator 1A denominator 1CA simplification  1A for 1 1A for $\frac{1}{3}$ 1CA simplification  <b>Answer only full marks</b> (3)	12.4.5 L3
			<b>[29]</b>

<b>QUESTION 5 [35 MARKS]</b>											
<b>Ques</b>	<b>Solution</b>		<b>Explanation</b>	<b>AS</b>							
5.1.1 (a)	$\text{Difference in cost per kWh} = \frac{R467,43}{600} - \frac{R94,99}{150}$ $= R 0,77905 - R0,63326$ $= R 0,145 \text{ OR } 14,5 \text{ cents}$ $\approx R 0,15 \text{ OR } 15 \text{ cents}$		1RT using correct values 1M finding the rate 1CA simplification  1CA difference (accept the answer in rand or cents)	12.4.4(2) 12.1.1(2) L2 (2) L3 (2)							
			<b>Answer only full marks</b>								
			(4)								
5.1.1 (b)	<table border="1"> <thead> <tr> <th><b>FAIR</b></th> <th><b>UNFAIR</b></th> </tr> </thead> <tbody> <tr> <td>The more electricity you use, the more you should pay. ✓✓R</td> <td>All people who use electricity should pay the same rate because they are using the same resource ✓✓R</td> </tr> <tr> <td><b>OR</b></td> <td></td> </tr> <tr> <td>15 cents per kWh is not a big difference. ✓✓R</td> <td></td> </tr> </tbody> </table>	<b>FAIR</b>	<b>UNFAIR</b>	The more electricity you use, the more you should pay. ✓✓R	All people who use electricity should pay the same rate because they are using the same resource ✓✓R	<b>OR</b>		15 cents per kWh is not a big difference. ✓✓R		2R reason (fair)  2R reason (unfair)	12.1.1 L4
<b>FAIR</b>	<b>UNFAIR</b>										
The more electricity you use, the more you should pay. ✓✓R	All people who use electricity should pay the same rate because they are using the same resource ✓✓R										
<b>OR</b>											
15 cents per kWh is not a big difference. ✓✓R											
<b>OR</b>											
Any suitable reason.			(4)								
5.1.2	$A = R467,43 - R393,67$ $= R73,76 \checkmark A$ $B = \frac{R888,83 - R728,63}{R728,63} \times 100\% \checkmark M$ $= 21,986\% \checkmark A$ $\approx 21,99 \%$ $C = R1\ 147,33 \times 123,38\% \checkmark M$ $= R1\ 147,33 \times 1,2338$ $= R1\ 415,58 \checkmark A$ <p><b>OR</b></p> $C = R1\ 147,33 + 23,38\% \text{ of } R1\ 147,33 \checkmark M$ $= R1\ 147,33 + R268,245754$ $\approx R1\ 147,33 + R268,25$ $\approx R1\ 415,58 \checkmark A$ <p><b>OR</b></p> $C = 123,38\% \text{ of } R1\ 148,33 \checkmark M \checkmark M$ $\approx R1\ 416,81 \checkmark A$		1A simplification  1M calculating %  1A simplification  1M increasing by a 25,12% 1A correct values used 1A simplification  <b>OR</b>  1M increasing by 25,12%  1A correct values used  <b>OR</b> 2M concept 1A simplification	12.1.3(4) 12.4.4(2)  L2							
			(6)								

Ques	Solution	Explanation	AS
5.1.3	<p>Monthly increase  <math>= R888,83 - R728,63^{\check{M}}</math>    <b>OR</b>    <math>21,99\% \times R728,63</math>  <math>= R160,20</math>    <math>= R160,23</math></p> <p>Annual increase = <math>12 \times R160,20</math>    <b>OR</b>    <math>12 \times R160,23</math>  <math>\check{CA} = R1\ 922,40</math>    <math>= R1\ 922,76</math></p> <p>Annual increase including VAT    <math>\check{M}</math>  <math>= R1\ 922,40 \times 1,14^{\check{M}}</math>    <b>OR</b>    <math>R1\ 922,76 \times 1,14</math>  <math>= R2\ 191,54^{\check{CA}}</math>    <math>= R2\ 191,9464</math>  <math>\approx R2\ 191,95^{\check{CA}}</math></p> <p style="text-align: center;"><b>OR</b></p> <p>Monthly increase  <math>= R888,83 - R728,63^{\check{M}}</math>    <b>OR</b>    <math>21,99\% \times R728,63</math>  <math>= R160,20</math>    <math>= R160,23</math></p> <p>Annual increase = <math>12 \times R160,20</math>    <b>OR</b>    <math>12 \times R160,23</math>  <math>= R1\ 922,40^{\check{CA}}</math>    <math>= R1\ 922,76</math></p> <p>Annual increase including VAT    <math>\check{M}</math>  <math>= R1\ 922,40 + 14\% \text{ of } R1\ 922,40^{\check{M}}</math>  <math>= R1\ 922,40 + R269,136</math>  <math>\approx R2\ 191,54^{\check{CA}}</math></p> <p style="text-align: center;"><b>OR</b></p> <p>Monthly increase  <math>= R888,83 - R728,63^{\check{M}}</math>  <math>= R160,20</math></p> <p>Monthly increase including VAT = <math>1,14 \times R160,20</math>    <math>\check{M}</math>  <math>= R182,628</math>  <math>= R182,63^{\check{CA}}</math></p> <p>Annual increase including VAT = <math>12 \times R182,63</math>  <math>= R2\ 191,56^{\check{CA}}</math></p>	<p>1M subtraction/ calculating %</p> <p>1CA annual increase</p> <p>1M including VAT</p> <p>1CA simplification</p> <p>1M subtraction/ calculating %</p> <p>1CA</p> <p>1M including VAT</p> <p>1CA simplification</p> <p>1M subtraction 1M including VAT</p> <p>1CA simplification 1CA simplification</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>Please note the small differences in the final answer depending on where the rounding off occurred</b></p> </div>	<p>12.1.1 L2 (1) L3 (3)</p>

(4)

Ques	Solution	Explanation	AS
5.2.1 (a)	First two members will need an area of $2 \text{ m}^2$ ✓A There are four other members who need $4 \times 0,7 \text{ m}^2$ ✓M $= 2,8 \text{ m}^2$ Total area $= 2 \text{ m}^2 + 2,8 \text{ m}^2$ $= 4,8 \text{ m}^2$ ✓CA $\text{Length} = \frac{\text{area}}{\text{breadth}} \quad \checkmark\text{M}$ $= \frac{4,8 \text{ m}^2}{1,5 \text{ m}}$ $= 3,2 \text{ m} \quad \checkmark\text{CA} \quad \checkmark\text{A}$	1 A recognising the $2\text{m}^2$ 1M multiplying 1CA total 1M using area formula 1CA simplification 1A unit <hr/> Answer only full marks (6)	12.3.1 L3
5.2.1 (b)	Volume of cylinder $= \pi \times r^2 \times \text{height}$ $150 \ell = 3,14 \times r^2 \times 1,2 \text{ m} \quad \checkmark\text{SF}$ $150\,000 \text{ cm}^3 = 3,14 \times r^2 \times 120 \text{ cm} \quad \checkmark\text{C}$ $r^2 = \frac{150\,000}{3,14 \times 120} \text{ cm}^2 \quad \checkmark\text{CA}$ $= 398,089172 \text{ cm}^2$ $r = 19,9521... \text{ cm} \quad \checkmark\text{CA}$ $\approx 20 \text{ cm} \quad \checkmark\text{R}$	1SF substitution 2C conversion 1CA manipulation 1CA finding square root 1R rounding (6)	12.3.1(4) 12.3.2(2) L3



Ques	Solution	Explanation	AS
5.2.2	<p>Cost of supplying and installing the geyser  <math>= R12\,490 - R4\,500</math>  <math>= R7\,990</math> ✓CA</p> <p>Monthly cost of heating water <math>= 0,45 \times R888,83</math> ✓M  <math>= R399,97</math> ✓A</p> <p>Number of months <math>= \frac{R7\,990}{R399,97}</math> ✓M  <math>= 19,976\dots</math> ✓CA  <math>\approx 19,98</math></p> <p>✓J  <b>YES</b> her statement is valid.</p> <p><b>OR</b></p> <p>Cost of supplying and installing the geyser  <math>= R12\,490 - R4\,500</math>  <math>= R7\,990</math> ✓CA</p> <p>Monthly cost of heating water <math>= 0,45 \times R888,83</math> ✓M  <math>= R399,97</math> ✓A</p> <p>Saving R399,97 per month for 2 years  Total saving <math>= R399,97 \times 24</math> months ✓M  <math>= R9\,599,28</math> ✓CA</p> <p>✓J  <b>YES</b> her statement is valid.</p>	<p>1CA simplification</p> <p>1M multiplication  1A calculating the savings</p> <p>1M dividing</p> <p>1CA simplification</p> <p>1J justification</p> <p><b>OR</b></p> <p>1CA simplification</p> <p>1M multiplication  1A calculating the savings</p> <p>1M multiplying  1CA simplification</p> <p>1J justification</p> <p>(6)</p>	<p>12.1.1  L4</p> <p>[35]</p>

**TOTAL: 150**