## basic education

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

## NATIONAL
## SENIOR CERTIFICATE

## GRADE 12

**MATHEMATICAL LITERACY P2**

**FEBRUARY/MARCH 2013**

**MEMORANDUM**

**MARKS: 150**

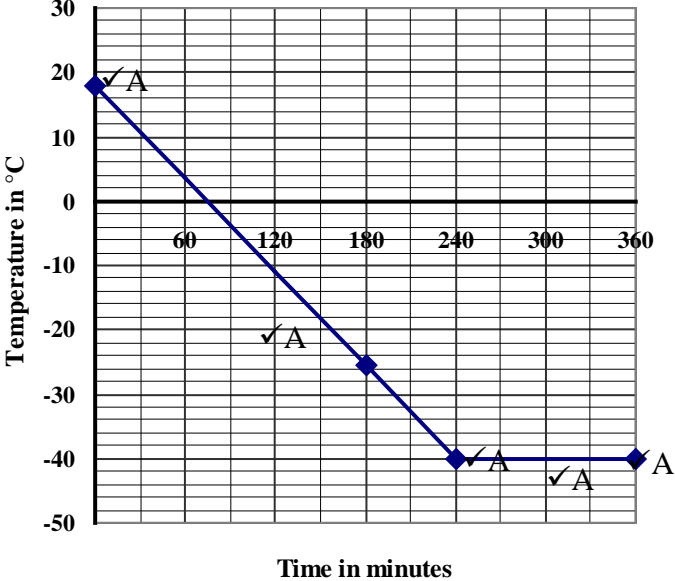| Symbol | Explanation |
|--------|-------------|
| M | Method |
| M/A | Method with accuracy |
| CA | Consistent accuracy |
| A | Accuracy |
| C | Conversion |
| S | Simplification |
| RT/RG | Reading from a table/Reading from a graph |
| SF | Correct substitution in a formula |
| O | Opinion/Example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

**This memorandum consists of 17 pages.**

**QUESTION 1 [24 MARKS]**

| Ques | Solution | Explanation | AS |
|---|---|---|---|
| 1.1.1 (a) | $7\frac{1}{2}$   8   $8\frac{1}{2}$   $8\frac{1}{2}$   9   9   9   9   $9\frac{1}{2}$ ✓M <br><br> The median score = 9 ✓✓A | 1M arranging in order <br><br> 2A correct identification <br> **Answer only full marks** <br> (3) | 12.4.3 L3 |
| 1.1.1 (b) | Range $= 9\frac{1}{2} - 7\frac{1}{2}$ ✓M <br> $= 2$ ✓A | 1M subtraction <br> 1A simplification <br> **Answer only full marks** <br> (2) | 12.4.3 L2 |
| 1.1.2 (a) | To eliminate scores of judges who are biased. ✓✓O <br><br> **OR** <br><br> Eliminating the highest and lowest scores will have the effect that the mean is calculated without extreme values ✓✓O <br><br> **OR** <br><br> Any other valid, well-thoughtout opinion | 2O opinion <br><br> OR <br><br><br> 2O opinion <br><br> (2) | 12.4.4 L4 |
| 1.1.2 (b) | Bongani's mean $= \dfrac{9+8+9+9+9+8\frac{1}{2}+8\frac{1}{2}}{7}$ ✓M <br><br> $= \dfrac{61}{7}$ ✓A ✓A <br> $= 8,714....$ <br> $= 8,71$ ✓CA <br><br> Graham's mean $= \dfrac{9+9+7\frac{1}{2}+8+8\frac{1}{2}+9+9}{7}$ ✓A <br><br> $= \dfrac{60}{7}$ ✓A <br> $= 8,5714...$ <br> $= 8,57$ ✓CA <br><br> $\therefore$ Bongani attained the higher mean score ✓CA | 1M concept of mean <br><br> 1A correct numerator <br> 1A correct denominator <br><br> 1CA simplification <br><br> 1A correct numerator <br><br> 1A concept of mean <br><br> 1CA simplification <br><br> 1CA conclusion <br> (8) | 12.4.3 L4 |

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

**QUESTION 2 [30 MARKS]**

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

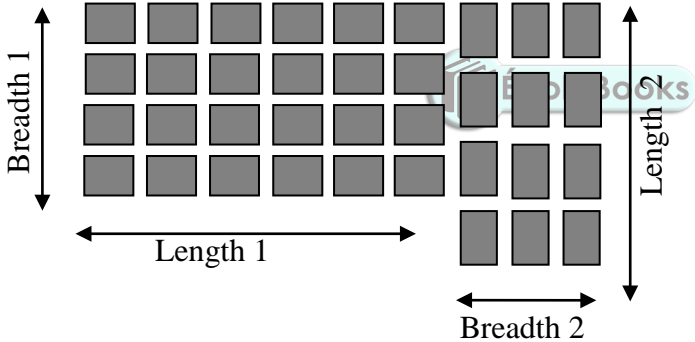| Ques | Solution | Explanation | AS |
|------|----------|-------------|-----|
| 2.2.2 | Number of extra crew members = 102 – 88 $\checkmark$M <br><br> = 14 $\checkmark$CA <br><br> $\checkmark\checkmark$J <br> He should buy one Small freezer boat as he can operate it with a maximum of 14 crew members.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

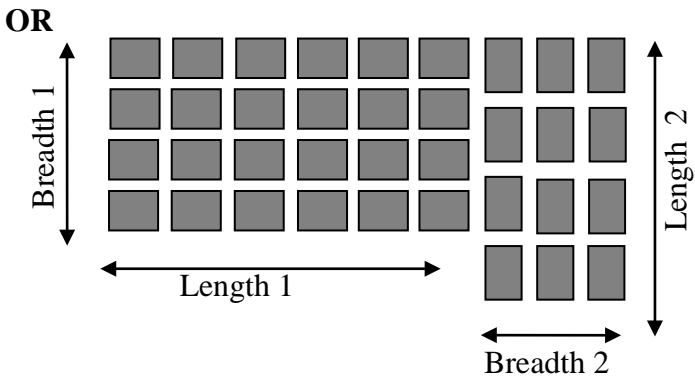| Ques | Solution | Explanation | AS |
|------|----------|-------------|-----|
| 2.3.2 | **TEMPERATURE AND TIME GRAPH**<br><br> | 1A plotting $(0;20)$<br>1A plotting $(240;–40)$<br>1A plotting $(360;−40)$<br><br>1A joining points with a straight line<br><br>1A horizontal line<br><br>                                     (5) | 12.2.2<br>L3(4)<br>L4(1) |
| 2.3.3 | Cooling rate = 14,5 °C per hour<br>$\qquad$ = 14,5 °C per 60 minutes ✓C<br>$\qquad$ = 2,4166... °C per 10 minutes ✓M<br>$\qquad$ ≈ 2,42 °C per 10 minutes<br><br>**YES** the claim is valid. ✓CA<br><br>$\qquad$**OR**<br><br>Cooling rate $= \dfrac{14,5°\text{C}}{60\ \text{min}} \times 10\ \text{min}$ ✓M<br>$\qquad\qquad\qquad\qquad\qquad$ ✓CA<br>$\qquad$ = 2,41666 °C per 10 minutes<br><br>**YES** the claim is valid. ✓CA | 1C converting to minutes<br>1M dividing by 6<br><br><br>1CA conclusion<br><br><br><br><br>1M finding the rate<br><br>1CA simplification<br><br>1CA conclusion<br>                                     (3) | 12.2.3<br>L4 |
|  |  |  | **[30]** |

**QUESTION 3 [31 MARKS]**

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

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

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

**QUESTION 4 [29 MARKS]**

| Ques | Solution | Explanation | AS |
|---|---|---|---|
| 4.1.1 | Breadth of tent increased by 15% <br> = 1,8 m + (0,15 × 1,8 m)  **OR**  1,8 m × 1,15 ✓M <br> = 2,07 m ✓A <br><br> Length of tent icreased by 15% <br> = 2,4 m + 0,15 ✗ 2,4 m ✓M  **OR**  2,4 m × 1,15 <br> = 2,76 m ✓A <br><br> Area needed for one tent = 2,76 m ✗ 2,07 m ✓M <br><br>       = 5,7132 m$^2$ ✓CA <br><br>      ✓A <br> Area needed for 36 tents = 36 ✗ 5,7132 m$^2$ <br><br>      = 205,6752 m$^2$ <br><br>      ≈ 205,68 m$^2$ ✓CA <br><br> **OR** <br><br>  <br><br> Breadth of tent increased by 15% <br> = 1,8 m + (0,15 × 1,8 m)  **OR**  1,8 m × 1,15 ✓M <br> = 2,07 m ✓A <br><br> Length of tent icreased by 15% <br> = 2,4 m + 0,15 ✗ 2,4 m  **OR**  2,4 m × 1,15 <br> = 2,76 m ✓A <br><br> Area of camp site <br>      ✓CA       ✓M       ✓CA <br> = [(6 × 2,76 m) + (4 × 2,07 m)] + [(4 × 2,76) <br>    × (3 × 2,07 m)] <br><br> = 137,1168 m$^2$ + 68,5584 m$^2$ ✓CA <br> = 205,6752 m$^2$ <br> ≈ 205,68 m$^2$ ✓CA | 1M increased % <br> 1A increased breadth <br><br><br><br> 1A increased length <br><br><br> 1M substitution <br><br> 1CA simplification <br><br><br> 1A for the 36 <br> 1M multiplication <br><br> 1CA simplification <br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br> 1M increased % <br> 1A increased breadth <br><br><br><br> 1A increased length <br><br><br> 1M substitution <br> 2CA use of correct values <br><br><br><br> 1CA simplification <br><br> 1CA solution | 12.3.1 <br> L3 (4) <br> L4 (4) |

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

        

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

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

ÉcoleBooks

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**QUESTION 5 [35 MARKS]**

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

| Ques | Solution | Explanation | AS |
|---|---|---|---|
| 5.1.3 | Monthly increase<br>$= R888,83 - R728,63$ ✓M   **OR**   $21,99\% \times R728,63$<br>$= R160,20$                 $= R160,23$<br><br>Annual increase $= 12 \times R160,20$  **OR**  $12 \times R160,23$<br>      ✓CA    $= R1\,922,40$      $= R1\,922,76$<br><br>Annual increase including VAT     ✓M<br>$= R1\,922,40 \times 1,14$ ✓M   **OR** $R1\,922,76 \times 1,14$<br>$= R2\,191,54$ ✓CA         $= R2\,191,9464$<br>                     $\approx$  $R2\,191,95$ ✓CA<br><br>               **OR**<br>Monthly increase<br>$= R888,83 - R728,63$ ✓M   **OR**   $21,99\% \times R728,63$<br>$= R160,20$                 $= R160,23$<br><br>Annual increase $= 12 \times R160,20$  **OR**  $12 \times R160,23$<br>            ✓CA<br>        $= R1\,922,40$   $= R1\,922,76$<br>Annual increase including VAT<br>    $= R1\,922,40 + 14\%$ of $R1\,922,40$  ✓M<br>    $= R1\,922,40 + R269,136$<br>    $\approx R2\,191,54$ ✓CA<br><br>               **OR**<br>Monthly increase<br>$= R888,83 - R728,63$ ✓M<br>$= R160,20$<br>                    ✓M<br>Monthly increase including VAT $= 1,14 \times R160,20$<br>                    $= R182,628$<br>                    $= R182,63$  ✓CA<br><br>Annual increase including VAT $= 12 \times R182,63$<br>                    $= R2\,191,56$  ✓CA | 1M subtraction/<br>calculating %<br><br><br><br>1CA annual increase<br><br><br><br>1M including VAT<br><br><br>1CA simplification<br><br><br><br>1M subtraction/<br>calculating %<br><br><br>1CA<br><br><br>1M including VAT<br><br>1CA simplification<br><br><br><br><br>1M subtraction<br>1M including VAT<br><br><br>1CA simplification<br>1CA simplification<br><br>**Please note the small differences in the final answer depending on where the rounding off occurred** | 12.1.1<br>L2 (1)<br>L3 (3) |
| | | (4) | |

                    

| Ques | Solution | Explanation | AS |
|------|----------|-------------|-----|
| 5.2.1 (a) | First two members will need an area of $2 \text{ m}^2$ ✓A<br><br>There are four other members who need $4 \times 0,7 \text{ m}^2$ ✓M<br>$= 2,8 \text{ m}^2$<br><br>Total area $= 2 \text{ m}^2 + 2,8 \text{ m}^2$<br>$= 4,8 \text{ m}^2$ ✓CA<br><br>Length $= \dfrac{\text{area}}{\text{breadth}}$ ✓M<br><br>$= \dfrac{4,8 \text{ m}^2}{1,5 \text{ m}}$<br><br>$= 3,2 \text{ m}$ ✓CA ✓A | 1 A recognising the 2m² <br><br>1M multiplying<br><br><br><br>1CA total<br><br>1M using area formula<br><br><br><br>1CA simplification<br>1A unit<br><br>**Answer only full marks**<br>(6) | 12.3.1<br>L3 |
| 5.2.1 (b) | Volume of cylinder $= \pi \times r^2 \times \text{height}$<br><br>$150 \ \ell = 3,14 \times r^2 \times 1,2 \text{ m}$ ✓SF<br>✓C<br>$150\,000 \text{ cm}^3 = 3,14 \times r^2 \times 120 \text{ cm}$ ✓C<br><br>$r^2 = \dfrac{150\,000}{3,14 \times 120} \text{ cm}^2$ ✓CA<br><br>$= 398,089172 \text{ cm}^2$<br><br>$r = 19,9521... \text{ cm}$ ✓CA<br>$\approx 20 \text{ cm}$ ✓R | 1SF substitution<br><br>2C conversion<br><br><br>1CA manipulation<br><br><br>1CA finding square root<br>1R rounding<br>(6) | 12.3.1(4)<br>12.3.2(2)<br>L3 |

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

**TOTAL:    150**