## NATIONAL SENIOR CERTIFICATE

### GRADE 12

#### SEPTEMBER 2014

### MATHEMATICAL LITERACY P2

#### MEMORANDUM

**MARKS:** 150

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Method</td>
</tr>
<tr>
<td>MA</td>
<td>Method with accuracy</td>
</tr>
<tr>
<td>CA</td>
<td>Consistent accuracy</td>
</tr>
<tr>
<td>A</td>
<td>Accuracy</td>
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<tr>
<td>C</td>
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<tr>
<td>S</td>
<td>Simplification</td>
</tr>
<tr>
<td>RT/FG/RM</td>
<td>Reading from a table/Reading from a graph/Read from map</td>
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<tr>
<td>F</td>
<td>Choosing the correct formula</td>
</tr>
<tr>
<td>SF</td>
<td>Substitution in a formula</td>
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<tr>
<td>J</td>
<td>Justification</td>
</tr>
<tr>
<td>P</td>
<td>Penalty, e.g. for no units, incorrect rounding off etc.</td>
</tr>
<tr>
<td>R</td>
<td>Rounding Off/Reason</td>
</tr>
</tbody>
</table>

This memorandum consists of 9 pages.
### QUESTION 1

#### 1.1

**Amount** = 358 110 – 258 750 ✓ ✓
\[
= 99 360 \times 0.30 ✓ ✓
\]
\[
= 29 808 + 53 096 ✓ ✓
\]
\[
= R82 904 ✓
\]

**2M** Subtracting by using the correct min and max values
**1M** Multiply by 30%
**1A** Consistent Accuracy (5)

#### 1.2

**Tax rebate** = Primary + Secondary + Tertiary
\[
= 12 080 + 6 750 + 2 250 ✓ ✓
\]
\[
= R21 080 ✓
\]

**2M** Adding all rebates
**1A** Consistent Accuracy (3)

#### 1.3

Persons who earn R67 111 or less is exempted from paying tax. ✓ ✓

**OR**

Any logical explanation.

**2A** Explanation (2)

#### 1.4

**Income tax based on taxable income** = 18% of each rand ✓ ✓
\[
= 0.18 \times 104 611 ✓
\]
\[
= R18 829.98 ✓
\]
\[
= R18 830 ✓
\]

**Actual Tax** = **Income Tax** – **Rebates**
\[
= 18 830 – (12 080 + 6 750) ✓
\]
\[
= 18 830 – 18 830 ✓
\]
\[
= R0 ✓
\]

**1F** Correct formula
**1M** Calculate 18%
**1A** Rounding to nearest rand
**1F** Correct tax bracket
**1S** Subtraction
**1CA** Multiplying by 30%
**1CA** subtracting rebate
**1A** dividing by 12 (6)

#### 1.5

**1.5.1**

**Annual taxable salary** = 22 421 x 12
\[
= R269 052 ✓
\]

**Tax payable** = 53 096 + (30% of the amount above 258 750) ✓ ✓
\[
= 53 096 + 0.3 \times (269 052 – 258 750) ✓
\]
\[
= 53 096 + (0.3 \times 10302) ✓
\]
\[
= 53 096 + 3090.60 ✓
\]
\[
= 56 186.60 – 12 080 ✓
\]
\[
= 44 106.60 ✓
\]

**Ann. Tax** = 44 106.60 ✓

**Monthly Tax** = 44 106.60 / 12
\[
= R3 675.55 ✓
\]

**Agree, his was over taxed by R557.70**
\[
(R4 233.25 – R3 675.55) ✓
\]

**1M** Monthly income x 12
**1F** Correct tax bracket
**1S** Subtraction
**1CA** Multiplying by 30%
**1CA** subtracting rebate
**1CA** dividing by 12 (8)
### 1.5.2 Net Salary = Allowances – Deductions

\[
\text{Net salary} = 45\ 742 - (3\ 675,55 + 1\ 685,57 + 1\ 156 + 3\ 230) \checkmark \\
= 45\ 742 - 9\ 747,12 \checkmark \\
= R35\ 994,88 \checkmark 
\]

1CA Total deductions 1CA (3)

### 1.5.3 % Pension Contribution

\[
\frac{1\ 685,57}{22\ 421} \times 100 \\
= 7,517... \\
= 7,5\% \checkmark 
\]

2M Correct values used 1A % to 1 dec. place (3)

### 1.5.4 Amount Saved = \(\frac{2}{3}\) x \(22\ 421\)

\[
= R\ 14\ 947,33 \checkmark 
\]

**OPTION 1**

\[ P = 14\ 947,33 \]

\[ i = 9,25/200 \]

\[ = 0,04625 \checkmark \]

\[ n = 3 \times 2 \]

\[ = 6 \checkmark \]

\[ A = P (1 + i)^n \]

\[ = 14\ 947,33(1 + 0,04625)^6 \checkmark \\
= 14\ 947,33(1,31163484) \checkmark \\
= 19\ 605,43347 \\
= R19\ 605,43 \checkmark 
\]

**OPTION 2**

\[ A = P (1 + ni) \]

\[ = 14\ 947,33(1 + 0,105 \times 3) \checkmark \\
= 14\ 947,33(1,315) \\
= 19\ 655,73895 \checkmark \\
= R19\ 655,74 \checkmark 
\]

**Difference**

\[ = R19\ 655,74 - R19\ 605,43 \checkmark \\
= R50,31 \checkmark 
\]

**OR**

**Difference**

\[ = (19\ 655,74 - 14\ 947,33) - (19\ 605,43 - 14\ 947,33) \checkmark \\
= 4\ 708,41 - 4\ 658,10 \\
= R50,31 \checkmark 
\]

1A Calculating \(i\) value 1A Calculating \(n\) value 1SF Substituting in correct formula 1S 1CA Correct rounding (12)
1.6 1.6.1 90% OR (0,9) of roses $\checkmark = 12 + 15$
\[\begin{align*}
\text{Total roses} & = 27 \checkmark \\
0.9 & = 30 \checkmark \\
\end{align*}\]
1A Finding difference as a %
1A
1M Dividing total by 90%
1CA Consistent Accuracy (4)

1.6.2 Different colours = 30 – 27 $\checkmark$
\[= 3 \text{ roses } \checkmark\]
1CA Subtracting 27
1CA Consistent Accuracy (2)

1.6.3 \(P(\text{a red rose}) = \frac{12}{30} \checkmark\)
\[= 40\% \checkmark\]
1CA correct numerator and denominator
1CA As a % (2)

1.6.4 \(\text{Price of 1 rose excluding VAT} = \frac{250}{30} \checkmark\)
\[= R8,333... \checkmark\]
1M Dividing 250 by 30 (CA)
1MA dividing by 1,14
1A
1CA correct rounding

\[\text{OR}\]
\[\text{Price of 1 rose excluding VAT} = \frac{250}{1,14} \checkmark\]
\[= 219,298... \checkmark\]
\[= R7,3099... \checkmark\]
\[= R7,31 \checkmark\]
1M Dividing 250 by 1,14
1MA dividing 250 by 1,14 (CA)
1M Dividing by 30 (CA)
1A
1CA correct rounding (4)

QUESTION 2

2.1 2.1.1 1. Attach Cam Shaft to the Press Disc by inserting stem of the Shaft into the Press Disc's center hole. Press firmly. You will hear a click as the Shaft snaps in place. \(\text{FIGURE D } \checkmark\)

2. Line the Tabs on the Motor Body up with the slots on the Cam Disc. Insert Cam Disc into the Motor Body. Using the two Grips on the Cam Disc, turning slightly clockwise until the Disc clicks into position. \(\text{FIGURE E } \checkmark\)

3. Fit the Shaft all the way inside the unit, the outside contours of the 2 Discs will line up. \(\text{FIGURE C } \checkmark\)
4. Select a disc and place it inside the Tube cover. Then place the Tube into the Tube Cover, turning clockwise until locked. **FIGURE B ✓**

5. With a spoon or spatula, load the freshly prepared dough into the top of the Tube. **FIGURE A ✓**

6. Look inside the Tube to see the ridges extending from top to bottom. These ridges align with the outside contours of the 2 Discs. Grasp Tube firmly, join the Body with the filled Tube and turn clockwise until the Tube locks into position. **FIGURE A ✓**

<table>
<thead>
<tr>
<th>2.1.2</th>
<th>Any logical and relevant explanation.</th>
<th>20</th>
<th>(2)</th>
</tr>
</thead>
</table>

| 2.2.1 | 10 mm = 1 cm and 12 mm = 1,2 cm
   Height of filled tube
   = 16,5 cm – 1 cm – 1,2 cm ✓ ✓
   = 14,3 cm ✓ |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1C Convert both to cm</td>
</tr>
<tr>
<td></td>
<td>1M Subtraction</td>
</tr>
<tr>
<td></td>
<td>1A</td>
</tr>
</tbody>
</table>

| 2.2.2 | Maximum height to be filled
   = 0,769 x 14,3 cm ✓
   = 10,9967 cm ✓ |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1M Calculate 76,9% of answer in Q2.2.1</td>
</tr>
<tr>
<td></td>
<td>1CA Consistent Accuracy</td>
</tr>
</tbody>
</table>

   Height not to be filled
   = 14,3 cm – 10,9967 cm ✓
   = 3,3033 cm
   = 3,3 cm ✓

   **OR**

   % Difference
   = 100% – 76,9% ✓
   = 23,1% ✓ |

   Height not to be filled
   = 0,231 x 14,3 cm ✓
   = 3,3033 cm
   = 3,3 cm ✓

   1M Difference in %
   1A |

| 2.2.3 | Number of cookies pressed
   = 14,3 cm
   0,5 cm ✓ ✓
   = 28,6 ✓
   = 28 cookies ✓ |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1C Convert 5 mm to cm</td>
</tr>
<tr>
<td></td>
<td>1CA Answer in Q2.2.1(dividing)</td>
</tr>
<tr>
<td></td>
<td>1A</td>
</tr>
<tr>
<td></td>
<td>1CA Correct rounding</td>
</tr>
</tbody>
</table>

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### QUESTION 3

#### 3.1

<table>
<thead>
<tr>
<th>3.1.1</th>
<th>Craven’s house = B1 ✓</th>
<th>1A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Loftus Versfeld Stadium = A3 ✓</td>
<td>1A</td>
</tr>
</tbody>
</table>

---

#### 2.3

**2.3.1** Circumference = \(2\pi r\ ✓ \)

\[
\begin{align*}
17,9094 &= 2 \times 3,142 \times r \checkmark \\
17,9094 &= 6,284r \\
17,9094 &= r \\
6,284 &= r \\
2,85 \text{ cm} &= r \checkmark
\end{align*}
\]

1F Use the correct formule
1SF Correct substitution
1M Divide both sides by 6,284
1A

#### 2.3.2** Area = \(\pi r^2\ ✓\)

\[
\begin{align*}
&= 3,142 \times 2,85^2 \checkmark \\
&= 25,520895 \text{ cm}^2 \checkmark
\end{align*}
\]

1F Use the correct formule
1SF Correct substitution
1A

#### 2.4

\(P(\text{disc 11 and tip 8}) = \frac{1}{12} \times \frac{1}{8} \)

\[
\begin{align*}
&= \frac{1}{96} \checkmark \\
&= 1\checkmark
\end{align*}
\]

1MA: Correct Numerator
1MA: Correct Denominator

#### 2.5

**2.5.1** Baking time = 15 min + 10 min ✓

\(= 25 \text{ min} \checkmark\)

1M: Adding time
1A

**2.5.2** Starting temperature

\(\degree C = \frac{(375 - 32)}{1,8} \ ✓\)

\[
\begin{align*}
&= 343 \\
&= 190,555... \\
&\approx 191\degree \checkmark
\end{align*}
\]

Reduced temperature = 375 \(\degree F – 25 \degree F \)

\(= 350 \degree F \checkmark\)

\[
\begin{align*}
\text{Celsius} &= \frac{(350 - 32)}{1,8} \ ✓ \\
&= 318 \\
&= 176,666... \\
&\approx 177\degree \checkmark
\end{align*}
\]

1F

1A rounded to nearest \(\degree\)

#### 2.5.3** Starting temperature = 200 \(\degree C\ ✓\)

Reduced temperature = 180 \(\degree C\ ✓\)

1A rounded to the nearest 20\(^\circ\)

1A rounded to the nearest 20\(^\circ\)

---

**[37]**
### 3.1.2 Direction

- East North-east (ENE) ✓
- North-east (NE) ✓
- Compass Bearing = 63° ✓ (Accept 61° – 65°)

**1A: Direction**

<table>
<thead>
<tr>
<th>1A: Direction</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

### 3.1.3 Map Scale

- 1 cm on the map ✓ represents 10 000 cm ✓ OR 100 m ✓ OR 0,1 km in reality ✓

**1A Refer to map**

<table>
<thead>
<tr>
<th>1A Refer to map</th>
<th>1A Refer to reality</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

### 3.1.4 Possible routes

1. Cross Walton Jameson Road into Villa Street, left into Farenden Street, right into Park Street. ✓ ✓ ✓

**OR**

2. Cross Walton Jameson Road into Villa Street, right into Farenden Street, left into Bond Street and left into Kirkness Lane. ✓ ✓ ✓

**Any other alternate route from Spuy Road ✓ ✓ ✓**

**3A Route must precede Spuy Road ✓ ✓ ✓**

### 3.1.5 Measurement in cm

#### 1.

- Distance = 13 x 0,1 km ✓ ✓
  - 1,3 km ✓

**Speed = Distance**

<table>
<thead>
<tr>
<th>1MA x scale</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time ✓</th>
<th>1SF</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>1S</th>
<th>2CA x 60</th>
</tr>
</thead>
</table>

- Time = 1,3 km
- 40 km/h
- 0,0325 ✓ x 60 ✓
- 1,95 min ✓

Yes, Craven’s statement is true. ✓

**OR**

#### 2.

- Distance = 14,7 x 0,1 km ✓ ✓
  - 1,47 km ✓

**Speed = Distance**

<table>
<thead>
<tr>
<th>1MA x scale</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time ✓</th>
<th>1SF</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>1S</th>
<th>2CA x 60</th>
</tr>
</thead>
</table>

- Time = 1,47 km
- 40 km/h
- 0,03675 ✓ x 60 ✓
- 2,205 min ✓

No, Craven's statement is not true. ✓

**Allow measurement of 2 mm**

*Please note: work with learners’ route in QUESTION 3.1.4*
3.1.6 Traffic lights ✓
Road works ✓
Traffic congestions ✓
(Any TWO relevant answer)

2A One mark per factor

2O Opinion

3.2
3.2.1 Range = highest value – lowest value
80 = 88 – lowest value
Lowest value = 88 – 80 ✓
= 8 ✓

1M Subtracting
80 from 88
1A

3.2.2 Mean = \( \frac{27+B+60+73+88+15+8+B+45+34+68+B+43+37+B+16+25+53}{18} \)

40 = 592 + 4B
18
40 x 18 = 592 + 4B
720 = 592 + 4B
720 – 592 = 4B ✓
128 = 4B
4
4
B = 32 ✓

1M adding all the values
1M dividing by 18
1A
1S
1CA value of B

3.2.3
8 ; 15 ; 16 ; 25 ; 27 ; 32 ; 32 ; 32 ; 32 ;
34 ; 37 ; 43 ; 45 ; 53 ; 60 ; 68 ; 73 ; 88 ✓

Median = \( \frac{32 + 34}{2} \)
= \( \frac{66}{2} \)
= 33 ✓

1M/A arranging
1M median concept
1CA (A and B’s values)

3.2.4 It is distorted by the outliers of 8 and 88. ✓✓

2O Opinion

3.2.5 Median ✓
Mean ✓

1A
1A

[32]

QUESTION 4

4.1
4.1.1 Visitors from:

<table>
<thead>
<tr>
<th></th>
<th>July</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>15</td>
<td>8</td>
<td>10 ✓</td>
<td>5</td>
<td>9</td>
<td>20 ✓</td>
<td>67</td>
</tr>
<tr>
<td>Abroad</td>
<td>10 ✓</td>
<td>3</td>
<td>12</td>
<td>6</td>
<td>4</td>
<td>26</td>
<td>61</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>11 ✓</td>
<td>22</td>
<td>11</td>
<td>13</td>
<td>46 ✓</td>
<td>128 ✓</td>
</tr>
</tbody>
</table>

6A 1 mark for each correct answer

(6)
4.1.2 Number of visitors from SA and abroad from July to December

5A 1 Mark each for any 5 stacks correctly plotted
1A Stacks labelled or key indicated (6)

4.1.3 Summer in South Africa ✓ ✓
Favourable weather conditions ✓ ✓
Popular tourist destination during the summer season ✓ ✓
(Accept any other relevant answer) 2O (2)

4.1.4 \[ P(\text{visitor in October}) = \frac{11}{128} = 0.0859375 = 0.086 \] 1A Numerator 1A Denominator 1A to 3 decimal places (3)

4.2 Visitor from USA = \[(450 \times 6) + (70 \times 7) \] ✓
\[ = 2700 + 490 \]
\[ = R3190 \] ✓
\[ \text{In } \$ = 3190 \]
\[ 8,17365 ✓ \]
\[ = 390, 2785169 \times 0.5 ✓ \]
\[ = \$195,139285 \]
\[ = \$200 ✓ \]
Deposit is correct ✓

Couple from France = \[(450 \times 2 \times 6) + (70 \times 2 \times 7) \] ✓
\[ = 5400 + 980 \]
\[ = R6380 \]
\[ \text{In } \€ = 6380 \]
\[ 10,4743384379 ✓ \]
\[ = 609,1076814 \times 0.5 \]
\[ = €304,5538407 \]
\[ = €300 ✓ \]
Deposit incorrect ✓

\[ \text{TOTAL: } 150 \]