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NATIONAL SENIOR CERTIFICATE EXAMINATION  
NOVEMBER 2020

## **MATHEMATICAL LITERACY: PAPER II**

### **MARKING GUIDELINES**

Time: 3 hours

150 marks

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These marking guidelines are prepared for use by examiners and sub-examiners, all of whom are required to attend a standardisation meeting to ensure that the guidelines are consistently interpreted and applied in the marking of candidates' scripts.

The IEB will not enter into any discussions or correspondence about any marking guidelines. It is acknowledged that there may be different views about some matters of emphasis or detail in the guidelines. It is also recognised that, without the benefit of attendance at a standardisation meeting, there may be different interpretations of the application of the marking guidelines.

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**QUESTION 1**

|                    |                                                                                                                                                                                                                                                                                                                                                                                                            |                  |              |              |              |              |             |              |   |    |                    |       |       |              |              |              |              |             |              |  |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------|--------------|--------------|--------------|-------------|--------------|---|----|--------------------|-------|-------|--------------|--------------|--------------|--------------|-------------|--------------|--|
| 1.1                | Because of inflation and not increasing their rates, they are earning less than they did.                                                                                                                                                                                                                                                                                                                  |                  |              |              |              |              |             |              |   |    |                    |       |       |              |              |              |              |             |              |  |
| 1.2.1              | $\text{Average} = \frac{6,34 + 5,27 + 4,62 + 4,38 + 5,17}{5}$ $= \frac{25,78}{5}$ $= 5,156$                                                                                                                                                                                                                                                                                                                |                  |              |              |              |              |             |              |   |    |                    |       |       |              |              |              |              |             |              |  |
| 1.2.2              | The additional years given show predictions relating to the inflation rate in the future based on the trends achieved in the previous years.                                                                                                                                                                                                                                                               |                  |              |              |              |              |             |              |   |    |                    |       |       |              |              |              |              |             |              |  |
| 1.3.1              | Standard: $2400 \times 105,16\% = \text{R}2\,523,84$<br>$\approx \text{R}2\,500$<br><br>Family Standard: $3000 \times 105,16\% = 3\,154,80 \approx \text{R}3\,200$<br><br><b>OR</b><br><br>Standard: $2\,400 \times 5,16\% = \text{R}123,84 = \text{R}2\,523,84$<br>$\approx \text{R}2\,500$<br><br>Family Standard: $3\,000 \times 5,16\% = \text{R}154,80 = \text{R}3154,80$<br>$\approx \text{R}3\,200$ |                  |              |              |              |              |             |              |   |    |                    |       |       |              |              |              |              |             |              |  |
| 1.3.2              | $\frac{5800 - 5200}{5200} \times 100 = 11,54\%$<br><br><b>OR</b><br><br>$\left( \frac{5\,800}{5\,200} \times 100\% \right) - 100\% = 11,54\%$                                                                                                                                                                                                                                                              |                  |              |              |              |              |             |              |   |    |                    |       |       |              |              |              |              |             |              |  |
| 1.4.1              | <table><tr><td>Number of people</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>8</td><td>9</td><td>10</td></tr><tr><td>Cost per night (R)</td><td>4 000</td><td>3 900</td><td><b>3 800</b></td><td><b>3 700</b></td><td><b>3 600</b></td><td><b>3 500</b></td><td><b>3 20</b></td><td><b>3 100</b></td></tr></table>                                                                            | Number of people | 1            | 2            | 3            | 4            | 5           | 8            | 9 | 10 | Cost per night (R) | 4 000 | 3 900 | <b>3 800</b> | <b>3 700</b> | <b>3 600</b> | <b>3 500</b> | <b>3 20</b> | <b>3 100</b> |  |
| Number of people   | 1                                                                                                                                                                                                                                                                                                                                                                                                          | 2                | 3            | 4            | 5            | 8            | 9           | 10           |   |    |                    |       |       |              |              |              |              |             |              |  |
| Cost per night (R) | 4 000                                                                                                                                                                                                                                                                                                                                                                                                      | 3 900            | <b>3 800</b> | <b>3 700</b> | <b>3 600</b> | <b>3 500</b> | <b>3 20</b> | <b>3 100</b> |   |    |                    |       |       |              |              |              |              |             |              |  |
| 1.4.2              | $C = 4\,000 - 100 \times (n - 1)$<br><br><b>OR</b><br><br>$C = 4\,000 - 100 \times n + 100 = 4\,100 - 100 \times n$                                                                                                                                                                                                                                                                                        |                  |              |              |              |              |             |              |   |    |                    |       |       |              |              |              |              |             |              |  |

|       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 1.4.3 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| 1.4.4 | <p><b>Cost of staying at the family standard chalet</b></p> <p>3 accuracy marks on the graph – (1 ; 4 000), (5 ; 3 600), (10 ; 3 100)</p>                                                                                                                                                                                                                                                                                                                          |  |
| 1.4.5 | 9 or 10                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
| 1.5.1 | $1,6 \text{ cm} \times 1\,200 = 1\,920 \text{ cm}$ (accept $1,4 = 1800 \text{ cm}$ )                                                                                                                                                                                                                                                                                                                                                                               |  |
| 1.5.2 | <p>Volume <math>\times 10</math><br/> <math>= 28\,952\,917,9 \text{ cm}^3</math></p> <p><b>OR</b> (if they use <math>1\,800 \text{ cm}</math>)</p> <p>Volume <math>= \pi \left( \frac{1\,800}{2} \right)^2 \times 10</math><br/> <math>= 25\,434\,000 \text{ cm}^3</math></p>                                                                                                                                                                                      |  |
| 1.5.3 | <p><math>28\,952\,917,9 \div (100)^3 = 28,95 \text{ m}^3</math><br/> <math>28,95 \times 469 = \text{R}13\,578,92</math><br/> <math>\therefore</math> He will not have enough.</p> <p><b>OR</b> (if they use <math>1\,800 \text{ cm}</math>)</p> <p><math>25\,434\,000 \div (100)^3 = 25,434</math><br/> <math>25,434 \times 469 = \text{R}11\,928,55</math><br/> <math>26 \times 469 = \text{R}12\,194</math><br/> <math>\therefore</math> He will have enough</p> |  |
| 1.5.4 | <p>Circumference <math>= 19,2 \times \pi = 60,31 \text{ m}</math><br/> <math>\frac{60,31}{2,5} = 24,1 \approx 24 \text{ stumps}</math></p> <p><b>OR</b></p> <p>Circumference <math>= 2 \times \pi \times 9,6 = 60,31 \text{ m}</math><br/> <math>\frac{60,31}{2,5} = 24,1 \approx 24 \text{ stumps}</math></p>                                                                                                                                                     |  |

**QUESTION 2**

|       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 2.1.1 | $11 \times 24 = 264 \text{ hours/year}$<br>$\frac{264}{261} = 1,011 \text{ hours/day/driver}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |
| 2.1.2 | $d = 264 \text{ hrs} \times 50 \text{ km/h} = 13\,200 \text{ km}$<br>$\frac{13\,200}{100} = 132$<br>$132 \times 9,4 \text{ L} = 1\,240,8 \text{ L}$<br>$1\,240,8 \text{ L} \times R\,15,84 = R19\,654,27$<br><br><b>OR</b><br><br>$D = 50 \text{ km/h} \times 1 \text{ h (rounded off answer from 2.1.1)}$<br>$D = 50 \text{ km}$<br>$9,4 \text{ L} : 100 \text{ km}$<br>$4,7 \text{ L} : 50 \text{ km}$<br>$4,7 \text{ L} \times R15,84 = R74,45 \text{ per day}$<br>$R74,45 \times 261 \text{ working days} = R19\,430,93$<br><br><b>OR</b><br><br>$D = 50 \times 261 = 13\,050$<br>$\begin{array}{r} 9,4 \quad : \quad 100 \\ \hline x \quad 13\,050 \\ x = 1\,226,70 \\ 1\,226,70 \times 15,84 \\ = R19\,430,93 \end{array}$<br><br>Using 1,011 hours = R19 644,67<br>Using 1,01 hours = R19 625,24 |  |
| 2.2.1 | $1\,306 - 41 = 1\,265$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
| 2.2.2 | $49 \times 0,25 = 12,25 \text{ hours}$<br>12 hours and 15 minutes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |

**QUESTION 3**

|       |                                                                                                                                                                                               |  |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 3.1.1 | 7                                                                                                                                                                                             |  |
| 3.1.2 | Upper 25% 33–36 years old<br><br>Maryka Holtzhausen = 33 years old<br><br>Erin Burger = 33 Years old<br><br>Phumza Maweni = 36 years old                                                      |  |
| 3.1.3 | $29,5 = \frac{326 + x}{12}$ $29,5 \times 12 - 326 = x$ $x = 28 \text{ years old}$ <p>No, her estimate is not correct.</p> <p><b>OR</b></p> $\frac{326 + 29}{12} = 29,58$ <p>∴ Not correct</p> |  |
| 3.1.4 | $1,9 \times 3,28 = 6,232 \text{ ft}$<br>$0,232 \times 12 = 2,78 \text{ in}$<br>∴ 1,9 m = 6 ft and 2,78 in                                                                                     |  |
| 3.1.5 | Answers may vary: She may be new to the team <b>OR</b> she may not have been available when they were collecting the data <b>OR</b> she is a substitute player <b>OR</b> Impact player.       |  |
| 3.1.6 | $\frac{4}{12} = \frac{1}{3}$ OR 0,3... <b>OR</b> 33.33...%                                                                                                                                    |  |
| 3.1.7 | $\frac{4}{12} + \frac{4}{12} = \frac{8}{12} = \frac{2}{3}$ <b>OR</b> 0,6... <b>OR</b> 66,66...%                                                                                               |  |
| 3.2.1 | $20\ 000 + 25\ 000 + 75\ 000 + 1\ 000\ 000 = \text{R}1\ 120\ 000$<br>$= \text{R}1,12 \text{ million}$<br><br><b>OR</b><br><br>$20\ 000 + 1\ 000\ 000 = \text{R}1\ 020\ 000$                   |  |

|       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 3.2.2 | $R1\ 200\ 000 = 109\%$<br>Therefore $1\% = R11\ 009,17$<br>$100\% = R11\ 00917,43$<br><br><b>OR</b><br><br>Previous years amount $= R1\ 200\ 000 \div 1,09$<br>$= R1\ 100\ 917,43$<br><br><b>OR</b><br><br>$\frac{1\ 200\ 000 - x}{x} \times 100 = 9\%$<br><br>$\frac{1\ 200\ 000}{x} - 1 = \frac{9}{100}$<br><br>$\frac{1\ 200\ 000}{x} = 0,09 + 1$<br><br>$1\ 200\ 000 \div 1,09 = x$<br>$x = R1\ 100\ 917,43$<br><br><b>OR</b><br><br>$1\ 200\ 000 \div 109\% = R\ 1\ 100\ 917,43$ |  |
| 3.3.1 | 47; 53; 54; 55; 65<br>Median = 54                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
| 3.3.2 | $47 + 11 = 58$                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |

| 3.3.3            | <p style="text-align: center;"><b>Goals scored for South Africa and their opponents</b></p> <table border="1"> <thead> <tr> <th>Dates of matches</th> <th>SA</th> <th>Opponent</th> </tr> </thead> <tbody> <tr> <td>1/12/2019</td> <td>54</td> <td>48</td> </tr> <tr> <td>30/11/2019</td> <td>53</td> <td>59</td> </tr> <tr> <td>20/7/2019</td> <td>55</td> <td>53</td> </tr> <tr> <td>19/7/2019</td> <td>47</td> <td>58</td> </tr> <tr> <td>17/7/2019</td> <td>65</td> <td>37</td> </tr> <tr> <td>15/7/2019</td> <td>66</td> <td>38</td> </tr> </tbody> </table>                                                                                                                        | Dates of matches | SA | Opponent | 1/12/2019 | 54 | 48 | 30/11/2019 | 53 | 59 | 20/7/2019 | 55 | 53 | 19/7/2019 | 47 | 58 | 17/7/2019 | 65 | 37 | 15/7/2019 | 66 | 38 |  |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----|----------|-----------|----|----|------------|----|----|-----------|----|----|-----------|----|----|-----------|----|----|-----------|----|----|--|
| Dates of matches | SA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Opponent         |    |          |           |    |    |            |    |    |           |    |    |           |    |    |           |    |    |           |    |    |  |
| 1/12/2019        | 54                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 48               |    |          |           |    |    |            |    |    |           |    |    |           |    |    |           |    |    |           |    |    |  |
| 30/11/2019       | 53                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 59               |    |          |           |    |    |            |    |    |           |    |    |           |    |    |           |    |    |           |    |    |  |
| 20/7/2019        | 55                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 53               |    |          |           |    |    |            |    |    |           |    |    |           |    |    |           |    |    |           |    |    |  |
| 19/7/2019        | 47                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 58               |    |          |           |    |    |            |    |    |           |    |    |           |    |    |           |    |    |           |    |    |  |
| 17/7/2019        | 65                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 37               |    |          |           |    |    |            |    |    |           |    |    |           |    |    |           |    |    |           |    |    |  |
| 15/7/2019        | 66                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 38               |    |          |           |    |    |            |    |    |           |    |    |           |    |    |           |    |    |           |    |    |  |
| 3.4.1            | <p>Nottingham – London 10,4 cm (Accept 10,3 -10,6)<br/> London – Birmingham 9,6 cm (Accept 9,5 – 9,8)<br/> Scale: 1,4 cm : 20 km<br/> 1,4 cm : 2 000 000 cm<br/> 1 : 1 428 571,429<br/> N – L : <math>10,4 \times 1\,428\,571,429 \div 100\,000 = 148,571</math> km<br/> (accept 147,14 – 151,429)<br/> L – B : <math>9,6 \times 1\,428\,571,429 \div 100\,000 = 137,1428</math> km<br/> (accept 135,714 – 140)<br/> <br/> Total distance = 285,7138 km<br/> <br/> <b>OR</b><br/> N – L : <math>10,4 \div 1,4 \times 20 = 148,571</math> km<br/> L – B : <math>9,6 \div 1,4 \times 20 = 137,1428</math> km<br/> Total distance = <math>148,571 + 137,1428 \approx 285,7138</math> km</p> |                  |    |          |           |    |    |            |    |    |           |    |    |           |    |    |           |    |    |           |    |    |  |
| 3.4.2            | $\frac{37,28}{0,621371} = 59,996 \approx 60 \text{ km/h}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |    |          |           |    |    |            |    |    |           |    |    |           |    |    |           |    |    |           |    |    |  |
| 3.5.1            | <p>A player that is 1,78 m also has a 70% success rate.<br/> A player that is 1,83 m also has an 80% success rate.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                  |    |          |           |    |    |            |    |    |           |    |    |           |    |    |           |    |    |           |    |    |  |
| 3.5.2            | <p>The taller the player the higher the percentage of goals scored. Player G is an outlier as she is not near the trendline, showing a tall height and low percentage goal rate.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                  |    |          |           |    |    |            |    |    |           |    |    |           |    |    |           |    |    |           |    |    |  |

**QUESTION 4**

|     |                                                                                                                                                                                                                                                                                                                               |  |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 4.1 | $14\,000 - 102 = 13\,898$<br><br>Annual Taxable Salary: $13\,898 \times 12 = R\,166\,776$<br><br>Income Tax: $166\,776 \times 18\% = R\,30\,019,68$<br><br>$30\,019,68 - 14\,220 - 7\,794 = R\,8\,005,68$<br><br>His statement is not valid.                                                                                  |  |
| 4.2 | Tax = 5 404,68<br><br>$14\,000 - \frac{5\,404,68}{12} - 102 - 140 = R13\,307,61$<br><br><b>OR</b><br><br>$13\,898 - \frac{5\,404,68}{12} - 140 = R13\,307,61$<br><br><b>OR</b><br><br>$14\,000 - \frac{8\,005,68}{12} - 102 - 140 = R13\,090,86$<br><br><b>OR</b><br><br>$13\,898 - \frac{8\,005,68}{12} - 140 = R13\,090,86$ |  |
| 4.3 | $136\,750 \div 12 = 11\,395,83$<br>$14\,000 - 11\,395,83 = R\,2\,604,17$<br><br><b>OR</b><br><br>$14\,000 \times 12 = 168\,000$<br>$168\,000 - 136\,750 = 31\,250$<br>$31\,250 \div 12 = R\,2\,604,17$                                                                                                                        |  |

**Total: 150 marks**