



Province of the  
**EASTERN CAPE**  
EDUCATION

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 12**

**SEPTEMBER 2018**

**MATHEMATICAL LITERACY P2  
MARKING GUIDELINE**

**MARKS: 150**

<b>Symbol</b>	<b>Explanation</b>
M	Method
M/A	Method with Accuracy
MCA	Method with Consistent Accuracy
CA	Consistent Accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG/RM	Reading from a table OR Reading from a graph OR Read from map
F	Choosing the correct formula
SF	Substitution in a formula
J	Justification
P	Penalty, e.g. for no units, incorrect rounding off etc.
R	Rounding Off OR Reason
AO	Answer only
NPR	No penalty for rounding

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This marking guideline consists of 11 pages.

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QUESTION 1 [39]			
Ques.	Solution	Explanation	Level
1.1.1	Municipality = $87 \times 5 \times 30$ ✓ = 13 050 litres ✓  Tank water = $250 - 87$ = 163 litres ✓  Tanks = $163 \times 5 \times 30$ = 24 450 litres ✓  Total for municipality and tanks = 13 050 litres + 24 450 litres = 37 500 litres ✓	1MA Multiply 5 and 30 1A Number of litres  1CA Litres for tank water 1CA Total litres for the month  1MCA Total litres (5)	L3
1.1.2	Litres used from tank = 24 450 No. of kilolitres = $24\,450 \div 1\,000$ = 24,45 kℓ ✓  First 6 = $6 \times 0$ 7 to 10 kℓ next 4 = $4 \times 7,14$ = R28,56 ✓ 11 to 15 kℓ = $5 \times 12,07$ = R60,35 ✓ 16 to 20 kℓ = $5 \times 17,65$ = R88,25 ✓ 21 to 30 kℓ = $4,45 \times 24,23$ = R106,93 ✓ Total amount = $R28,56 + R60,35 + R88,25 + R106,93$ = R284,09 ✓ Amount with VAT = $R284,09 \times 1,14$ ✓ = R323,86 ✓  Statement is valid ✓	<b>CA from 1.1.1</b> 1C Converting to kilolitres  1MA 2 <sup>nd</sup> Tariff  1MA 3 <sup>rd</sup> Tariff  1MA 4 <sup>th</sup> Tariff  1MA 5 <sup>th</sup> Tariff  1CA Total amount 1M Calculating VAT 1CA VAT incl 1O Valid (9)	L3 and L4

1.1.3	<p>Tank 1:  <math>\text{Volume} = \pi r^2 h</math> ✓✓  <math>= 3.142 \times \left(\frac{105}{2}\right)^2 \times 142</math> ✓  <math>= 1\,229\,739,525 \div 1\,000</math> ✓  <math>= 1\,229,7</math> ✓  <math>= 1\,000</math> litres ✓</p> <p>Tank 2:  <math>\text{Volume} = \pi r^2 h</math>  <math>= 3,142 \times (90)^2 \times 210</math>  <math>= 5\,344\,542 \div 1\,000</math>  <math>= 5\,344,542</math>  <math>= 5\,000</math> litres ✓</p> <p>Total = <math>1\,000 + 5\,000</math>  <math>= 6\,000</math> litres ✓</p> <p>Water needed from tanks = 24 450 litres</p> <p>Statement invalid. Cannot have enough water if it does not rain. ✓</p>	<p>1C mm to cm  1SF Substitution  1MA Finding the radius  1S Simplification  1C Convert to litres  1R Nearest thousand</p> <p>1CA Rounded to nearest thousand</p> <p>1CA Total volume for two tanks</p> <p>1O Not valid (9)</p>	L3
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1.2.1	<p>Grade 10 : Grade 11 : Grade 12  Ratio 5 : 3 : 2  Grade 10 = 250 book packs  Total = 5 + 3 + 2  = 10 ✓</p> <p><math>\frac{5}{10} \times \text{total no. of book packs} = 250 \checkmark</math>  <math>0,5 \times \text{total number of book packs} = 250 \checkmark</math>  Total number of book packs = <math>\frac{250}{0,5} \checkmark</math>  = 500 book packs ✓</p> <p><b>OR</b></p> <p>5 = 250  1 = <math>250 \div 5</math>  = 50 ✓</p> <p>3 = <math>50 \times 3</math>  = 150 ✓</p> <p>2 = <math>50 \times 2</math>  = 100 ✓</p> <p>Total = <math>250 + 150 + 100 \checkmark</math>  = 500 ✓</p>	<p>1M Adding ratio  1M Concept of ratio  1M Changing subject of formula  1M Dividing  1CA Number of book packs</p> <p>1MA Unit ratio</p> <p>1MA Finding value of 3</p> <p>1MA Finding value of 5</p> <p>1M Addition  1CA Total book packs (5)</p>	L3
1.2.2	<p>Amount for books packs = <math>R320 \times 500</math>  = R160 000 ✓</p> <p>Amount without VAT = <math>\frac{R160\,000}{1,15} \checkmark</math>  = R139 130,43 ✓</p> <p>VAT = <math>R160\,000 - R139\,130,43 \checkmark</math>  = R20 869,57 ✓</p> <p>Amount for 50 = <math>R3\,20 \times 50</math>  = R16 000 ✓</p> <p>Statement is valid ✓</p>	<p><b>CA from 1.2.1</b>  1MCA Cost for book packs  1M Dividing by 1,15  1CA Amount before VAT  1M Subtraction  1CA VAT amount</p> <p>1MCA Amount of 50 book packs  1O Valid (7)</p>	L4
1.2.3	<p>Probability = <math>\frac{150}{500} + \frac{100}{500}</math></p> <p>= <math>\frac{250}{500} \checkmark \times 100</math>  = 50% ✓</p>	<p><b>CA from 1.2.1</b>  1MCA Adding correct fractions  1CA Numerator  1CA Denominator  1CA Percentage (4)</p>	L2

<b>Question 2 [43]</b>			
<b>Ques.</b>	<b>Solution</b>	<b>Explanation</b>	<b>Level</b>
2.1.1 (a)	Mean 2015 $= 59,6 + 76,9 + 75,7 + 68,2 + 97,1 + 77 + 84 + 70,4 + 71,4 + 49,1 + 58,6 \checkmark$ $= \frac{788}{11} \checkmark$ $= 71,64 \checkmark$	1M Adding 1M Dividing by 11 1CA Mean (3)	L2
2.1.1 (b)	Mean 2016 $= 69,5 + 75,4 + 73,7 + 65,3 + 97,4 + 76,5 + 84 + 70,5 + 71,3 + 57,1 + 52$ $= 786,7$ $= \frac{786,7}{11} \checkmark$ $= 71,52 \checkmark$ Statement invalid $\checkmark$	1MA Adding and dividing 1CA Mean 1O Invalid (3)	L4
2.1.2	<b>2015</b> 49,1; 58,6; 59,6; 68,2; 70,4; 71,4; 75,7; 76,9; 77; 84; 97,1 $\checkmark$ $Q_3 (A) = 77\% \checkmark$  $IQR = 77 - 59,6$ $= 17,4\% \checkmark$  <b>2016</b> 51,5; 52,0; 65,3; 69,5; 70,5; 71,3; 73,7; 75,4; 76,5; 84,0,97,4  $Q_1 (B) = 65,3\% \checkmark$  $IQR = 76,5 - 65,3$ $= 11,2\% \checkmark$  Statement valid $\checkmark$	1M Ascending order 1CA $Q_3 (A)$  1CA IQR    1A $Q_1 (B)$  1CA IQR  1O Valid (6)	L4

2.2.1	<p>Annual income = R31 625 × 12 = R379 500 ✓</p> <p>Tax = 61 910 + 31% of taxable income above 296 540 ✓ = 61 910 + 0,31 × (379 500 – 296 540) ✓ = 61 910 + 0,31 × 82 960 ✓ = 61 910 + 25 717,6 = 87 627,6 – R13 635 ✓ = 73 992 ÷ 12 = 6 166,05 ✓</p> <p>Grants for 10 children = 380 × 10 = 3 800 ✓</p> <p>2 old age people = 1 600 × 2 = 3 200 ✓</p> <p>Total = 3 200 + 3 800 = R7 000 ✓</p> <p>Statement invalid ✓</p>	<p>1MA Annual income</p> <p>1RT Correct tax bracket 1SF Substitution 1S Simplification 1M Subtract rebate 1CA Monthly tax</p> <p>1MA Child grant for 10</p> <p>1MA Old age grant for 2 1CA Total grants 1O Invalid (10)</p>	L3 and L4
2.2.2	<p>Amount after first year = R31 625 × 1,058 ✓ = R33 459, 25 ✓</p> <p>Amount after second year = R33 459, 25 × 1,068 = R35 734,48 ✓</p> <p>Annual salary = R35 734,48 × 12 ✓ = R428 813,75 ✓</p> <p style="text-align: center;"><b>OR</b></p> <p>Total annual income = 31 625 × 12 ✓ = 379 500 ✓ × 1,058 ✓ × 1,068 ✓ = R428 813,75 ✓</p>	<p>1M Multiplying by 5,8% 1CA Value for 1<sup>st</sup> year</p> <p>1CA Value for 2<sup>nd</sup> year 1M Multiplying by 12 1CA Annual salary</p> <p>1M Multiplying by 12 1CA Salary 1CA Value for 1<sup>st</sup> year</p> <p>1CA Value for 2<sup>nd</sup> year 1CA Annual salary (5)</p>	L2

2.3.1	$KZN = OAG + CSG$ $= 669\,634 + 2\,776\,098 \checkmark$ $= 3\,445\,732 \checkmark$  $WC = OAG + CSG$ $= 330\,039 + 993\,038$ $= 1\,323\,077 \checkmark$  $Difference = 3\,445\,732 - 1\,323\,077$ $= 2\,122\,655 \checkmark$	1RT Correct values for KZN 1CA Total   1CA Total   1CA Difference(4)	L2
2.3.2	Northern Cape $\checkmark\checkmark$	2RT Province (2)	L2
2.3.3	Gauteng has a greater population $\checkmark\checkmark$	2A Reason (2)	L4
2.3.4	FS and NW $\checkmark$ remains the same $\checkmark$ in 2017 and 2018  The number of the rest of the provinces $\checkmark$ decreases $\checkmark$	1A Both FS & NW 1A Remains the same 1A Rest of provinces 1A Decrease (4)	L4

2.3.5	<p>War Veteran grant for the EC, KZN, NC and LP for 2017 and 2018</p> <p>Number of WVG</p> <p>Provinces</p>	Both bars plotted correctly for  1MA EC 1MA KZN 1MA NC 1MA LP   (4)	L2
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Question 3 [31]			
Ques.	Solution	Explanation	Level
3.1.1	<p>Measured distance from Cape Town to Durban = 8,1 cm ✓✓ <b>Accept 7,9 cm to 8,3 cm</b></p> <p>Bar Scale 3 cm ✓ = 500 km <b>Accept 2,9 cm to 3,1 cm</b></p> <p>Actual Distance = <math>\frac{500 \times 8,1}{3}</math> ✓ = 1 350 km ✓</p> <p>Time taken by first family = 21:00 – 8:00 – 1,5 = 11,5 hrs ✓</p> <p>Speed of family = <math>\frac{1\,350\text{ km}}{11,5\text{ hrs}}</math> = 117,39 km/h ✓</p> <p>Time taken by second family = 21:00 – 8,50 – 1,5 = 11 hrs ✓</p> <p>Speed of family = <math>\frac{1\,350\text{ km}}{11\text{ hrs}}</math> = 122,72 km/h ✓</p> <p>Statement is valid ✓</p>	<p>2A Measure distance</p> <p>1A Measure bar scale</p> <p>1C Convert distance using bar scale</p> <p>1CA Distance</p> <p>1CA Time</p> <p>1CA Speed</p> <p>1CA Time</p> <p>1CA Speed</p> <p>1O Valid</p> <p><b>NPR</b> (10)</p>	L4
3.1.2	Zambia ✓✓	2A Country (2)	L2
3.2.1	<p>Unknown length (1) = 12 cm – 6 cm = 6 cm</p> <p>Unknown length (2) = 10 cm – 2 cm – 4 cm = 4 cm</p> <p>Perimeter = 10 + 4 + 4 + 2 + 12 + 6 + 6 + 2 + 6 + 4 ✓✓✓ = 56cm ✓</p>	<p>1M Finding 6 cm</p> <p>1M Finding 4 cm</p> <p>1M Adding all values</p> <p>1CA Perimeter(4)</p>	L2
3.2.2	<p>Area = <math>\ell \times b</math></p> <p>Figure 1 = 10 cm × 4 cm = 40 cm<sup>2</sup> ✓</p> <p>Figure 2 = 4 cm × 6 cm = 24 cm<sup>2</sup> ✓</p> <p>Figure 3 = 6 cm × 6 cm = 36 cm<sup>2</sup> ✓</p> <p>Total area = 40 cm + 24 cm + 36 cm = 100 cm<sup>2</sup> ✓</p> <p>Area of page = 28 cm × 20 cm = 560 cm<sup>2</sup> ✓</p> <p>Area of unshaded part = 560 – 100 ✓ = 460 cm<sup>2</sup> ✓</p>	<p><b>CA from 3.2.1</b></p> <p>1MA Calculating area</p> <p>1MCA Area</p> <p>1MCA Area</p> <p>1CA Total area</p> <p>1CA Area of page</p> <p>1M Subtraction</p> <p>1CA Unshaded area (7)</p>	L3



3.3.1	<p>Satara to Olifants = 54km ✓  N'wanetsi to Lower Sabi = 108km ✓</p> <p>Distance is half; therefore, it can take them half the time to travel. ✓✓</p>	<p>1RT Correct distance  1RT Correct distance  2 Explanation (4)</p>	L2 & L4
3.3.2	<p>Punda to Mopani = 130 km  Mopani to Paul Kruger = 220 km ✓  Total = 130 km + 220 km  = 350 km ✓</p> <p>Skukuza to Pafuri = 380 km</p> <p>Difference = 380 km – 350 km  = 30 km ✓  Statement valid ✓</p>	<p>1RT Correct values  1MA Adding distances</p> <p>1CA Difference  1O Valid (4)</p>	L2 & L4

<b>QUESTION 4 [37]</b>			
<b>Ques.</b>	<b>Solution</b>	<b>Explanation</b>	<b>Level</b>
4.1.1	Not offered at certain universities ✓✓ <b>OR</b> No students registered for the course ✓✓	2A Reason (2)	L4
4.1.2	Fees for Business at Bond = \$33 640 Fees for Engineering at Edith Cowan = \$ 25 760 ✓ Total = 33 640 + 25 760 = 59 400 ✓ \$1 = R9,68 \$59 400 = 9,68 × 59 400 ✓ = R 574 992 ✓	1RT Both values correct  1CA Total  1C Convert to Rand 1CA Amount in Rand (4)	L3
4.1.3	Fees greater than \$15 000, but less than \$ 30000 $= \frac{7}{10}$ ✓✓ $= 0,7$ ✓	1A Numerator 1A Denominator 1CA Decimal (3)	L2
4.2.1	% increase = $\frac{38\,249 - 29\,678}{29\,678} \times 100$ ✓✓ = 28,88% ✓	1RT Using correct values 1SF Substitution 1M Multiply by 100 1CA Percentage <b>NPR</b> (4)	L2
4.2.2	December ✓ People get bonuses in December ✓✓ <b>OR</b> People budget to spend in December ✓✓✓	1A Month 2R Reason (3)	L2 & L4
4.2.3	August 2015 – 30 633 August 2016 – 31 556 ✓ Difference = 31 556 – 30 633 = 923 ✓ Amount = 923 × 550 000 = R507 650 000 ✓  14, 81 = 1 Euro $507\,650\,000 = 1 \times \frac{507\,650\,000}{14,81}$ ✓ = 34 277 515,19 Euro ✓	1RT Both values correct 1MCA Difference  1MCA Amount   1C Convert to € 1CA Amount in € (5)	L3

4.3.1	<p>Hours worked:</p> <p>Level 3: Day 1 = 5 hours ✓  Day 2 to 13 = 10 hrs × 12  = 120 ✓  Day 14 = 8 hrs  Total number of hours = 5 + 120 + 8 hours  = 133 hours ✓</p> <p>Level 2 = 133 hours</p> <p>Level 1 = 133 – 4 ✓  = 129 hours ✓</p> <p>Amount for Level 3 = 248 × 133 × 2  = R65 968 ✓</p> <p>Amount for Level 2 = 133 × 218,24 × 6  = R174 155,52 ✓</p> <p>Amount for Level 1 = 129 × 163,68 × 32  = R675 671,04 ✓</p> <p>Total Amount = 65 968 + 174 155,52 + 675 671,04  = R915 794,56 ✓  Statement invalid ✓</p>	<p>1A Hrs for Day 1  1MA Hrs for Day 2 to 13</p> <p>1CA Total number of hours</p> <p>1M Subtracting  1CA Calculating hours for Level 1</p> <p>1MCA Amount Level 3</p> <p>1MCA Amount Level 2</p> <p>1MCA Amount Level 1</p> <p>1CA Total amount  1O Invalid (10)</p>	L4
4.3.2	<p>Distance for 14 days = 14 km × 2 × 14 days ✓  = 392 km ✓</p> <p>Transport Cost for all employees  = 392 km × 3,18 × 40  = R49 862,40 ✓</p> <p>Amount as a fraction = <math>\frac{49\,862,40}{915\,794,56}</math> ✓  = 0,05 ✓  Statement is valid ✓</p>	<p><b>CA from 4.3.1</b>  1MA Return multiply by 14  1CA Total distance</p> <p>1MCA Transport cost  1M Dividing values  1CA Decimal  1O Valid (6)</p>	L4
		<b>TOTAL:</b>	<b>150</b>