GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GAUTENG DEPARTMENT OF EDUCATION

PREPARATORY EXAMINATION

2018

MARKING GUIDELINES

MATHEMATICAL LITERACY PAPER 2 (10602)

Symbol	Explanation
M	Method
MA	Method with accuracy
CA	Consistent accuracy
MCA	Method with constant accuracy
A	Accuracy
C	Conversion
S	Simplification
RT / RG / RD	Reading from a table / graph / diagram
SF	Correct substitution in a formula
O	Opinion / Example / Definition / Explanation
R	Rounding off
NPR	No penalty rounding or omitting units
AO	Answer only, full marks
J	Justify

KEY TO TOPIC SYMBOL:

F = Finance; M = Measurement; MP = Maps, Plans and other representations; DH = Data Handling; P = Probability

10 pages

GAUTENG DEPARTMENT OF EDUCATION

PREPARATORY EXAMINATION

MATHEMATICAL LITERACY
(Paper 2)

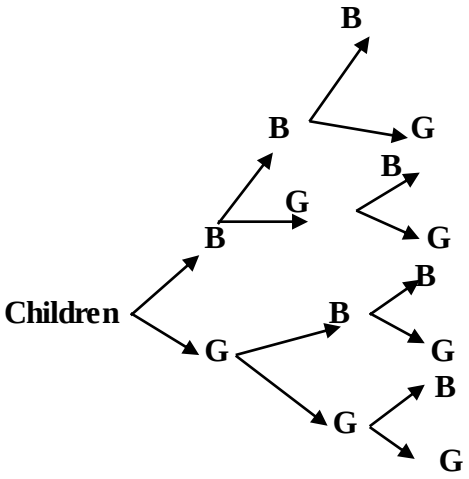
MARKING GUIDELINES

Q1	ANSWER	EXPLANATION	LEVEL
1.1.1	Monthly salary = $\frac{\text{Monthly taxable income}}{0,925}$ = R33 412,65 ÷ 0,925✓ = R36 121,78✓ Annual salary = R36 121,78 x 12✓ = R433 461, 36✓	1 SF substituting R33 412,65 1 A answer 1 MCA multiply by 12 1 CA answer	F3 [4]
1.1.2	He is under 65 years old and earning an income of more than R75 750✓; therefore, he qualifies to pay tax. ✓	1 O explanation 1 J justification	F4 [2]
1.1.3	Taxable income before rebates = R61 910 + 31% (R400 951,80 – R296 540) ✓✓ = R94 277,66✓ Medical credit = R303 x 2 x 12✓ = R7272✓ Payable tax = R94 277,66 – R7272 – R13500✓ = R73 505,66✓ Monthly tax = R73 505,66 ÷ 12✓ = R6 125,47✓ Therefore, his claim is invalid. ✓	1 RT correct tax bracket 1 SF substituting R400 951,80 1 A answer 1 M multiplying by 2 and 12 1 CA answer 1 M subtracting rebates and medical credits 1 CA answer 1 MCA dividing by 12 1 CA answer 1 J justification	F4 [10]

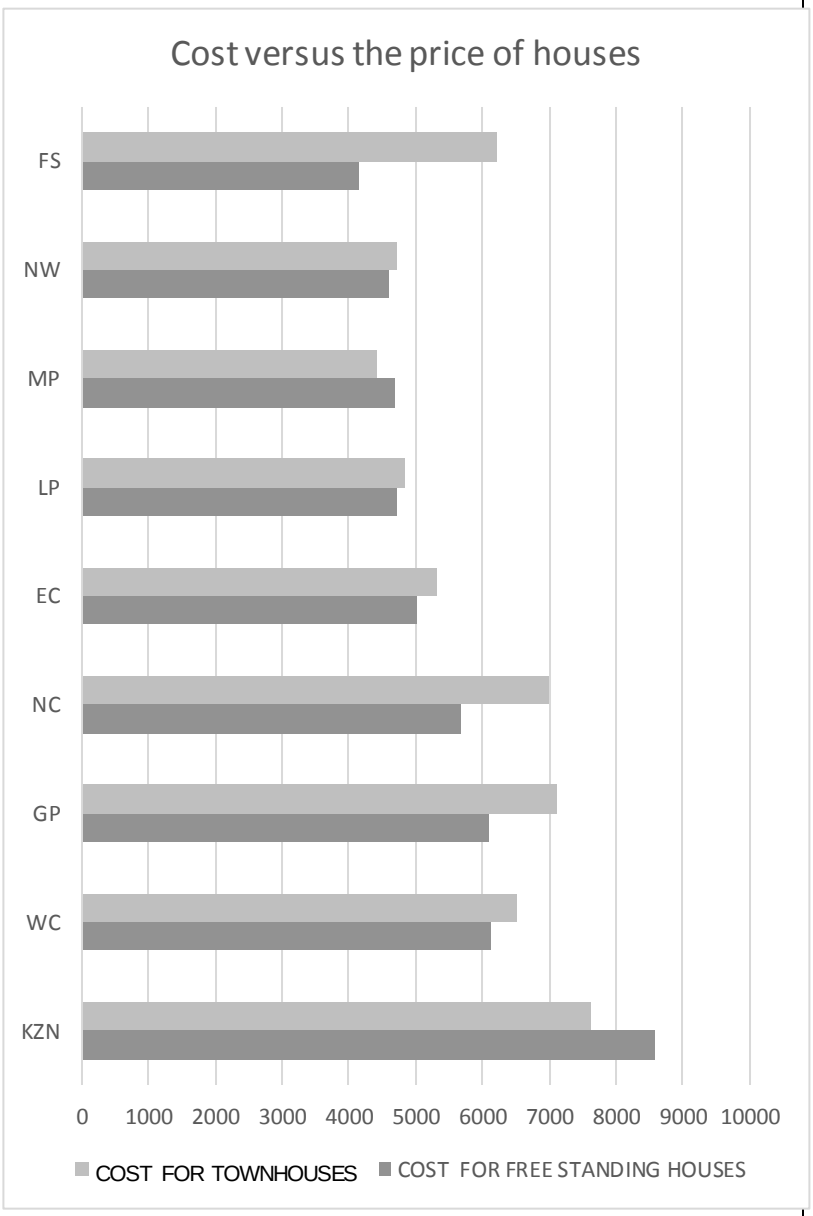
Q1	ANSWER	EXPLANATION	LEVEL
1.2.1 (a)	Cost of wages = 30% of R321 021,56✓ = R96 306,47✓	1 M multiplying by 30% 1 A answer	F2 [2]
(b)	Cost of wages for each employee = R96 306,47 ÷ 4✓ = R24 076,62✓ Monthly cost = R24 076,62 ÷ 3✓ = R8025,54✓ **OR** 3 x 4✓ = 12✓ Cost of wages for each employee = R96 306,47 ÷ 12✓ = R8025,54✓	1 MCA dividing by 4 1 A answer 1 M dividing by 3 1 A answer 1 M multiplying 3 by 4 1 A answer 1 MCA dividing by 12 1 A answer	F3 [4]
1.2.2	Cost of materials (VAT exclusive) = R321 021,56 – R96 306,47✓ = R224 715,09✓ Cost of materials (VAT inclusive) = R224 715,09 × 114%✓✓ = R256 175,20✓ His claim is valid✓	1 M subtracting 1 A answer 2 M multiplying by 114% 1 A correct values 1 J justification	F4 [6]
1.2.3	**Institution A**: 10% ÷ 2 = 5%✓ Term 1: 105% of R210 050✓ = R220 552,50✓ Term 2: 105% of R220 552,50 = R231 580,13✓ **Institution B**: 8% ÷ 4 = 2%✓ Term 1 : 102% of R210 050 = R214 251✓ Term 2 : 102% of R214 251 = R218 536,02✓ Term 3: 102% of R218 536,02 = R222 906,74✓ Term 4: 102% of R222 906,74 = R227 364,88✓ True, he will repay less for a loan from institution B. ✓	1 A for 5% 1 M multiplying by 105% 1 A answer 1 CA answer 1 A for 2% 1 A answer 1 CA answer 1 CA answer 1 CA answer 1 J opinion	F4 [10]
			[38]

Q2	ANSWER	EXPLANATION	LEVEL
2.1.	Bedrooms 3 and 4✓ Because they are on the northern side of the house. ✓✓	1 A correct answer 2 J justification	MP2 [3]
2.2	Area = $(l \times b)_A + (l \times b)_B$ = $(7m \times 3m)$ ✓ + $(4m \times 3m)$✓ ✓ = $21m^2 + 12m^2$ = 33 m^2 ✓ **OR** Area = $(l \times b)_A + (l \times b)_B$ = $(6m \times 4m)$✓ + $(3m \times 3m)$✓ ✓ = $24m^2 + 9m^2$ = 33 m^2 ✓ **OR** Area = (7m × 6m) ✓– (3m × 3m) ✓✓ = $42m^2 - 9m^2$ = 33 m^2 ✓	1 SF substitution of correct values 1 A value of 3 1 A value of 4 1 CA answer 1 SF substitution of correct values 1 A value of 4 1 A value of 3 1 CA answer	M2 [4]
2.3	Number of boxes = $\frac{33}{2}$ = 16,6 ≈ 17 boxes✓ Cost for tiling = R189,99 × 17✓ = R3 229,83✓ Cost for two extra boxes of tiles =R189,99 × 2 = R379,98✓ Total cost = R3 229,83 + R379,98 = R3 609,81✓ **OR** Number of boxes = 17✓ + 2✓ = 19✓ Cost = 19 × R189, 99✓ = R3 609,81✓	**CA from 2.2** 1 R answer 1 M for multiplication 1 A answer 1 A answer for extra boxes 1 CA final answer 1 R for number of boxes 1 A for extra boxes 1 A answer 1 M for multiplication 1 CA answer	F3 [5]
2.4	3days : 8,40m^2 x : 73m^2 ✓ ∴ $8{,}40x = 3 \times 73m^2$ ✓ $\frac{8{,}40x}{8{,}40} = \frac{219}{8{,}40}$ $x = 26{,}0714285$ ∴ $26{,}0714285 \div 7 = 3{,}72$ ✓ ≈ 4 weeks✓	1 M for the proportion 1 M for multiplying correctly 1 CA answer 1 R for rounding	M3 [4]
			[16]

Q3	ANSWER	EXPLANATION	LEVEL
3.1.1	Surface Area = $2(\ell \times h) + 2(w \times h) + 2(\ell \times w)$ $= 2(1{,}1 \times 2) + 2(0{,}86 \times 2) + 2(1{,}1 \times 0{,}86)$ ✓✓ $= 9{,}73 m^2$ ✓	1 C for 0,86 1 SF for correct substitution 1 A answer	M2 [3]
3.1.2	Radius = 0,65 ✓ Volume of a cylindrical geyser $= \pi r^2 h$ $= 3{,}142\ (0{,}65)^2 \times 2$ ✓ $= 2{,}65 m^3$ ✓ Volume of a rectangular cylinder $= \ell \times w \times h$ $= 1{,}1 \times 0{,}86 \times 2$ ✓ $= 1{,}89 m^3$ ✓ True, cylindrical geyser is bigger / has a greater capacity ✓	1 A value of radius 1 SF for correct substitution 1 A answer 1 SF correct substitution 1 A answer 1 J justification **NPR**	M4 [6]
3.1.3	Radius = 65 cm and height = 200 cm ✓ Volume $= 3{,}142 \times (65\ cm)^2 \times 200\ cm$ ✓ $= 265\ 4990\ cm^3$ ✓ Therefore: 95% of 265 4990 cm^3 = 252 2240,5 cm^3 ✓ 252 2240,5 $cm^3 \div 1000$ = 2 522,2405 ℓ ✓ ≈ 2 522 ℓ ✓	1 C both *r* and *h* 1 SF substitution of correct values 1 A answer 1 CA answer 1 C conversion to litres 1 R rounding of litres	M3 [6]
3.2.1	Cost for 39 kℓ without levy = (R0,00 × 6) + (R7,24 × 4) + (R11,84 × 5) + (R17,46 × 5) + (R23,34 × 10) + (R25,10 × 9) = R0,00 + R28,98 + R59,20 + R87,30 + R233,40 + R225,90 ✓✓✓ = R634,78 ✓ Water levy = 10% of R634,78 = R63,48 ✓ Cost for 39 kℓ including levy = R634,78 + R63,48 = R698,26 ✓	 1 A for every 2 correct answers (3A) 1 CA answer 1 CA answer 1 CA answer	F3 [6]
3.2.2	2 ÷ 5 ✓ of R698,26 ✓ = R279,30 ✓ True, it is less than R300 ✓	1 A for correct fraction / proportion 1 M multiplying correct values 1 A answer 1 J justification	F4 [4]

Q3	ANSWER	EXPLANATION	LEVEL
3.2.3	 **Outcomes:** BBB BBG BGB BGG GBB GBG GGB GGG The probability of having a boy as the first born and to have a girl and boy in any order is $\frac{2}{8}$ = 25%	1 A for each correct branch (3A) 2 A for outcomes 1 A probability 1 CA percentage	P3 [7]
			[32]

Q4	ANSWER	EXPLANATION	LEVEL
4.1.1	Free standing house ✓ The average price of building a free standing house in RSA is cheaper than building a townhouse.✓ ✓	1 A correct answer 2 O opinion	D4 [3]
4.1.2	Q_1 = (R4 698 + R4 609) ÷ 2✓✓ = R4 653,50✓ Q_3 = (R6 136 + R6 102) ÷ 2 = R6 119✓ IQR = $Q_3 - Q_1$✓ = R6 119 – R4 653,50✓ = R1 465,50✓	1 RG correct values 1 M adding values and dividing by 2 1 A correct answer 1 A correct answer 1 A correct formula 1 SF correct values 1 CA answer	D3 [7]
4.1.3	• The type of landscape, dominated by rocky lands. ✓ • Ocean, it is difficult to build in a sandy soil. ✓ • Tourist attraction. • More reinforcement is needed. **Accept any valid answer**	1 O for reason / opinion 1 O for reason / opinion	MP4 [2]
4.1.4	An average is calculated by adding all the real values divided by the total number of plans.✓✓ You cannot calculate an average by adding averages and dividing by the number of provinces. **Accept any valid answer**	2 J for reason	D2 [2]

Q4	ANSWER	EXPLANATION	LEVEL
4.1.5		1 A correct type 1 A for FS and NW 1 A for MP, LP and EC 1 A for NC and GP 1 A for WC and KZN	D2 [5]
4.2.1	Number of full-time employees = 25% × 40✓✓ = 10 employees✓	1 RT for 25% 1 M for multiplying by 40 1 A correct answer	D2 [3]
4.2.2	Number of part-time employees = 75% x 120✓✓ = 90 employees✓	1 RT for 75% 1 M for multiplying by 120 1 A correct answer	D2 [3]
4.2.3	Median, ✓ because it shows salary paid to half of the employees. ✓✓	1 A correct answer 2 J explanation	D4 [3]
4.2.4	Range = Max value – Min value✓ = R14 000 – R6 000✓ = R8 000✓	1 A correct formula 1 SF correct values 1 A answer	D2 [3]

Q4	ANSWER	EXPLANATION	LEVEL
4.2.5	It only focuses on outliers; few employees might fall in this category. It is only based on the difference between the highest salary and the lowest salary. ✓✓	2 O explanation	D2 [2]
4.2.6	50% of part time employees earn a salary of more than R11 000, whereas 50% of the full time employees earn a salary of more than R10 000. ✓✓ Therefore, part time employees are paid better salaries. ✓✓ **OR** The minimum and maximum salaries of full-time employees are higher than those of part-time employees ✓✓ Therefore Pule is correct ✓✓	2 A referring to minimum, median or maximum 2 J conclusion	D4 [4]
4.2.7	Full time employment✓ The least paid employee earns R7 000,00✓✓	1 A correct choice 2 O Explanation	D4 [3]
			[40]

Q5	ANSWER	EXPLANATION	LEVEL
5.1	• Off-ramp to N12 and join N8 to Bloemfontein. ✓✓ • Off-ramp to N3 and join N5 after Harrismith, then join N1 to Bloemfontein. ✓✓✓	5 A for describing routes that pass through a national road from Johannesburg to Bloemfontein.	MP2 [5]
5.2	Measured distance: 4,3 cm✓ Bar: 2,2 cm✓ Actual distance = (4,3 cm ÷ 2,2 cm) × 300 km✓✓ = 586 km✓ Return distance = 586 km × 2✓ = 1172 km✓ **OR** 2,2 cm : 300 km 2,2 cm : 30 000 000 km 1 : 13 636 364 ∴ 4,3 cm × 13 636 364 = 58 636 365 cm ∴ 58 636 365 cm ÷ 100 000 = 586 km 586 km × 2 = 1172 km	1 A for 4,3 cm **(Accept: 4,1 - 4,5 cm)** 1 A for 2,2 cm **(Accept: 2,1 - 2,3 cm)** 1 MA for division 1 A for using 300 km 1 A for answer 1 MCA for multiplying by 2 1 CA answer Note: measure on final copy	MP3 [7]
5.3	Time taken = 15h15 min - 10h45✓ = 4 hours and 30 min✓ = 4,5 hours✓ $\boldsymbol{Speed = \frac{Distance}{Time}}$ $= \frac{586\text{ km}}{4{,}5h}$ ✓ = 130,22 km / h ✓ = 130 km / h ✓	1 M for subtraction 1 A for answer 1 C for conversion 1 M Method 1 CA answer 1 R correct rounding	M3 [6]
5.4	The general speed limits in terms of the South African National Road Traffic Act are: **60 km / h** on a public road within an urban area; **100 km / h** on a public road outside an urban area which is not a freeway; **120 km / h** on freeways. ✓✓	2 O Opinion *Accept any sensible explanation*	MP2 [2]
5.5	• It does not give enough detail. ✓✓ • It does not have distances between cities and towns. ✓✓	4 O Opinion *Accept any sensible explanation*	MP2 [4]
			[24]
		TOTAL	**150**