



NATIONAL SENIOR CERTIFICATE EXAMINATION
EXEMPLAR 2014

MATHEMATICAL LITERACY: PAPER II

MARKING GUIDELINES

Time: 3 hours

150 marks

Key

AT = Application Topic

F – Finance

M – Measurement

R – Maps, Plans and Other Representations

D – Data-Handling

P – Probability

TL = Thinking Level

MA = Mark Allocation

✓^a = Accuracy Mark

✓^{ca} = Continued Accuracy Mark

✓^m = Method Mark

		MA	AT	TL
	QUESTION 1			
1.1.1	KNP (SANParks) 146 NW 57 LIM 52 KZN 38 MP 17 GP 15 EC 4 FS 3 NC 1 MNP (SANParks) 0 WC 0 ✓^a Data labelled. ✓^a✓^{ca} Data sorted from highest to lowest.	3	D	3
1.1.2	It is easier to see which provinces are the most affected by rhino poaching, in order to know where to prioritise. ✓^m✓^m Logical explanation given.	2	D	2
1.2.1 (a)	See Answer Booklet ✓^a Double-Bar Graph ✓^a Gap between provinces ✓^a per province = 3 marks ✓^a Key (Poach and arrest columns labelled) ✓^a Axes labelled and appropriate scale ✓^a Heading	8	D	3
1.2.1 (b)	KZN ✓^a – it has the greatest difference between poaching and arrests. ✓^m	2	D	4
1.2.2	Learner A – Has not labelled axes ✓^a✓^a Learner B – Incorrect scale on vertical axis (starts at 5) ✓^a✓^a	4	D	4
1.3	2010 – 6 2011 – 16 2012 – 26 2010 – 2011: $\frac{16 - 6}{6} \times 100$ = 166,67% 2011 – 2012: $\frac{26 - 16}{16} \times 100$ = 62,5% ∴ 2010 – 2011 was the best.	7	D	3

		MA	AT	TL
1.4.1	Total: $1\,646 + 251 + 173 + 465 + 201 + 517 + 105 + 213 + 39 \checkmark^m = 4\,179 \checkmark^a$ $\frac{1\,646 \checkmark^a}{4\,179 \checkmark^a} \times 500 \checkmark^m$ $= 196,94$ $= 197 \text{ employees } \checkmark^m \quad (\text{Appropriate Rounding})$	5	D	3
1.4.2	(a) $\frac{1\,646}{197} \checkmark^m$ Using answer from Question 1.4.1 as denominator $= 8,36$ $= 8 \text{ rhino } \checkmark^{ca} \text{ or } 9 \text{ rhino } \{\text{Accept both}\}$ (b) $125\,754 \times 247,105 \checkmark^m$ $= 31\,744\,421,7 \text{ acres } \checkmark^{ca}$ $\frac{31\,074\,442,17 \checkmark^m}{197}$ $= 157\,738 \text{ acres } \checkmark^{ca}$	6	D	3

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		MA	AT	TL
	QUESTION 2			
2.1.1	$A = P(1 + i)^n$ $A = 7\,000 \checkmark^a \left(1 + \frac{0,883}{100}\right)^2 \checkmark^m$ $A = 7\,124,165 \dots \text{people}$ $A = 7\,124 \checkmark^{ca}$ $\therefore 7\,124 - 7\,000 \checkmark^m$ $= 124 \text{ people born } \checkmark^{ca}$	5	F	2
2.1.2	$A = P(1 - i)^n$ $A = 7\,000 \checkmark^a \left(1 - \frac{1,38}{100}\right)^2 \checkmark^m$ $A = 6808,13 \dots \text{people}$ $A = 6\,808 \checkmark^{ca}$ $\therefore \text{Population} = 6\,808 + 124 \checkmark^m$ $= 6\,932 \checkmark^{ca}$	5	F	2
2.1.3	The mortality rate is greater than the birth rate. $\checkmark^m$ Hence, Barrydale would have a very small population. $\checkmark^m$	2	F	4
2.2.1	See Answer Booklet Farm Design - Total Area Length = 30 blocks $\checkmark^a$ Breadth = 20 blocks $\checkmark^a$ (or any measurements which give 150 km^2) - Holiday resort Length = 5 blocks $\checkmark^a$ Breadth = 1 block $\checkmark^a$ - Dam Diameter = 1 block $\times$ 2 dams $\checkmark^a$ - Landing strip Length = 3 blocks $\checkmark^a$ Breadth = $\frac{1}{2}$ block $\checkmark^a$	7	R	2

		MA	AT	TL
2.2.2	- Total Area $A = 150 \text{ km}^2$ - Holiday Resort $A = 2,5 \times 0,5$ $A = 1,25 \text{ km}^2 \checkmark^a$ - Dam $A = (3,14)(0,25 \checkmark^a)^2 \times 2 \checkmark^m$ $A = 0,3925 \text{ km}^2 \checkmark^{ca}$ - Landing strip $A = 1,5 \times \frac{1}{4}$ $A = 0,375 \text{ km}^2 \checkmark^a$ Area left for cattle = $150 - 1,25 - 0,3925 - 0,375 \checkmark^m$ $= 147,9825555 \text{ km}^2 \checkmark^{ca}$ $\therefore$ Number of cattle farm can accommodate: $= 147,9825 \times 12,5 \checkmark^a$ $= 1\,849,78 \checkmark^{ca}$ $= 1\,849 \text{ cattle } \checkmark^{ca}$	10	M	4
2.3	See Answer Booklet $\checkmark^a \checkmark^a \checkmark^a \checkmark^a$ Income and Expenses grouped correctly {Subtract 1 mark per incorrectly grouped account} Calculation Income: $= 52\,850 + 16\,400 + 7\,500 + 2\,000 \checkmark^m$ $= R78\,750$ Expenses: $R2\,150 + R2\,500 + R3\,800 + R18\,000 + R9\,650 + R48\,000 + R590 \checkmark^m$ $= R84\,690$ $\therefore R78\,750 - 84\,690 \checkmark^a$ $= -R5\,940 \text{ loss } \checkmark^{ca}$ Conclusion: Loss $\checkmark^{ca}$	9	F	4

		MA	AT	TL
2.4.1	Learners may use a tree diagram. 1 mark per 2 combinations. <pre> graph LR Root(()) --- G Root --- C G --- W1[W] G --- H1[H] G --- B1[B] C --- W2[W] C --- H2[H] C --- B2[B] W1 --- S1[S] W1 --- N1[N] H1 --- S2[S] H1 --- N2[N] B1 --- S3[S] B1 --- N3[N] W2 --- S4[S] W2 --- N4[N] H2 --- S5[S] H2 --- N5[N] B2 --- S6[S] B2 --- N6[N] S1 --- GWS[GWS] N1 --- GWN[GWN] S2 --- GHS[GHS] N2 --- GHN[GHN] S3 --- GBS[GBS] N3 --- GBN[GBN] S4 --- CWS[CWS] N4 --- CWN[CWN] S5 --- CHS[CHS] N5 --- CHN[CHN] S6 --- CBS[CBS] N6 --- CBN[CBN] GWS --- ca1[✓^a] GWN --- ca2[✓^a] GHS --- ca3[✓^a] GHN --- ca4[✓^a] GBS --- ca5[✓^a] GBN --- ca6[✓^a] CWS --- ca7[✓^a] CWN --- ca8[✓^a] CHS --- ca9[✓^a] CHN --- ca10[✓^a] CBS --- ca11[✓^a] CBN --- ca12[✓^a] </pre>	6	P	3
2.4.2	$\frac{6 \checkmark^a}{12 \checkmark^a} = \frac{1}{2} \checkmark^{ca}$	3	P	2

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		MA	AT	TL
	QUESTION 3			
3.1.1	Number of rows = $3 \div 0,5$ (One wire every 50 cm) $= 6 + 1$ (ground) $= 7$ rows ✓^a Perimeter = $(20 + 0,5 + 0,5 \checkmark^a) \times 3 \checkmark^m$ $= 63 \text{ m} \checkmark^{ca}$ Total = $63 \times 7 \checkmark^a$ $= 441 \text{ m} \checkmark^{ca}$ No. of rolls = $441 \div 5 \checkmark^m$ $= 88,2$ $= 89$ rolls ✓^{ca} Cost = $89 \times 55 \checkmark^m$ $= \text{R}4\,895 \checkmark^{ca}$	10	M	3
3.1.2	$\therefore$ Total Surface Area = $\frac{1}{2} (b \times \perp) \times 4$ $= \frac{1}{2} (21 \times 15) \times 4 \checkmark^m$ (correct subs.) $= 630 \text{ m}^2 \checkmark^{ca}$ Cost = $630 \times 670 \checkmark^m$ $= \text{R}442\,100 \checkmark^{ca}$	4	F	3
3.1.3	Learner must list 2 logical ways in which to reduce the cost of the boma. • Make the boma smaller ✓^m • Use less fairy lights (i.e. every 100cm) ✓^m • Use cheaper material other than thatch • Use cheaper fairy lights • Use local thatching instead of imported • Install the lights yourself	2	F	4
3.2.1	Horizontal Axis Units – Should be from 1 – 10 ✓^a Vertical Axis Label – Amount Raised (Rands) ✓^a Heading – Fund-raising	2	F	2
3.2.2	Method 1 ✓^a – if no kilometres are run, then no money is raised. (There is no initial donation.) ✓^m	2	F	4
3.2.3	Method 1: R20 per kilometre. ✓^m Method 2: R50 donation ✓^m plus R10 per kilometre. ✓^m	3	F	4

		MA	AT	TL
3.2.4	See Answer Booklet ✓ ^a Straight Line ✓ ^a Starts at R50 ✓ ^a Point of intersection at 5 km/R100 ✓ ^a Ends at R150	4	F	3
3.2.5	If less than 5 km, then Method 1. ✓ ^m If greater than 5 km, then Method 2. ✓ ^m If 5 km, any of the two methods.	2	F	4
3.3	Bottle $V = \pi r^2 h$ $V = (3,14)(5)^2 (25)$ ✓ ^m $V = 2\,198\text{ cm}^3$ ✓ ^{ca} Nozzle $V = (3,14)(0,4)^2 (2)$ ✓ ^m $V = 1,0048\text{ cm}^3$ ✓ ^{ca} Total Volume = $2\,198 + 1,0048$ ✓ ^m = $2\,199,0048\text{ cm}^3$ ✓ ^{ca} Number of litres required = $2\,199,0048 \div 1\,000$ ✓ ^m $\times 50$ ✓ ^m = 109,95 litres ✓ ^{ca} = 110 litres	9	M	4

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		MA	AT	TL
	QUESTION 4			
4.1	Incorrect. ✓ ^a North-East ✓ ^a	2	R	2
4.2.1	Joseph divided by 3,1 ✓ ^m instead of multiplying by 3,1. ✓ ^a Petrus converted incorrectly. ✓ ^m 8 km = 800 000 cm ✓ ^a	4	R	4
4.2.2	Scale: 1 cm : 8 km Real-life: $3,1 \times 8$ ✓ ^a ✓ ^a = 24,8 km ✓ ^{ca} OR Scale: 1 cm : 8 km 1 : 800 000 ✓ ^a Therefore: 3,1 cm on map = 2 480 000cm in real-life ✓ ^a Convert to km: $2\,480\,000 \div 100\,000$ = 24,8 km ✓ ^{ca}	3	R	2
4.3.1	$24,85 \times 1,609344$ ✓ ^m = 39,999 ... = 40 km/h ✓ ^{ca}	2	R	2
4.3.2	$\frac{10,4}{40}$ ✓ ^a = 0,26 ... hours ✓ ^{ca} = 15 minutes ✓ ^{ca} 36 seconds ✓ ^{ca}	4	R	3
4.3.3	$10,4 \div 9,2$ ✓ ^m = 1,13 litres $\therefore 1,13 \times 12,87$ ✓ ^m = R14,55 ✓ ^a	3	F	3
4.4.1	Between miles 6 and 7 ✓ ^a	1	R	4
4.4.2	Yes. ✓ ^a Starting elevation is ± 190 ft and Finish elevation is ± 190 ft. ✓ ^m	2	R	4
4.4.3	Highest elevation ± 390 ft ✓ ^a {Accept anything between 380 ft and 400 ft} Lowest elevation ± 175 ft ✓ ^a {Accept anything between 165 ft and 185 ft} Range = $390 - 175$ = 215 ft ✓ ^{ca} $\therefore$ Bruce is correct. ✓ ^m	4	D	4
4.4.4	$21,1 \text{ km} \div 1,609344$ ✓ ^a = 13,11 miles ✓ ^{ca} Elevation map ends just after 13 miles, hence half-marathon. ✓ ^m	3	R	4

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Total: 150 marks