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:** $\frac{16-6}{6}$ ✓[a] × 100 ✓[m] = 166,67% ✓[ca] **2011 – 2012:** $\frac{26-16}{16}$ ✓[a] × 100 ✓[m] = 62,5% ✓[ca] ∴ 2010 – 2011 was the best. ✓[ca]	7	D	3

		MA	AT	TL
1.4.1	**Total:** 1 646 + 251 + 173 + 465 + 201 + 517 + 105 + 213 + 39 ✓m = 4 179 ✓a $\frac{1\,646}{4\,179}$ ✓a ✓a × 500 ✓m = 196,94 = 197 employees ✓m (Appropriate Rounding)	5	D	3
1.4.2	(a) $\frac{1\,646}{197}$ ✓m Using answer from Question 1.4.1 as denominator = 8,36 = 8 rhino ✓ca or 9 rhino {Accept both} (b) 125 754 × 247,105 ✓m = 31 74 442,17 acres ✓ca $\frac{31\,074\,442,17}{197}$ ✓m = 157 738 acres ✓ca	6	D	3

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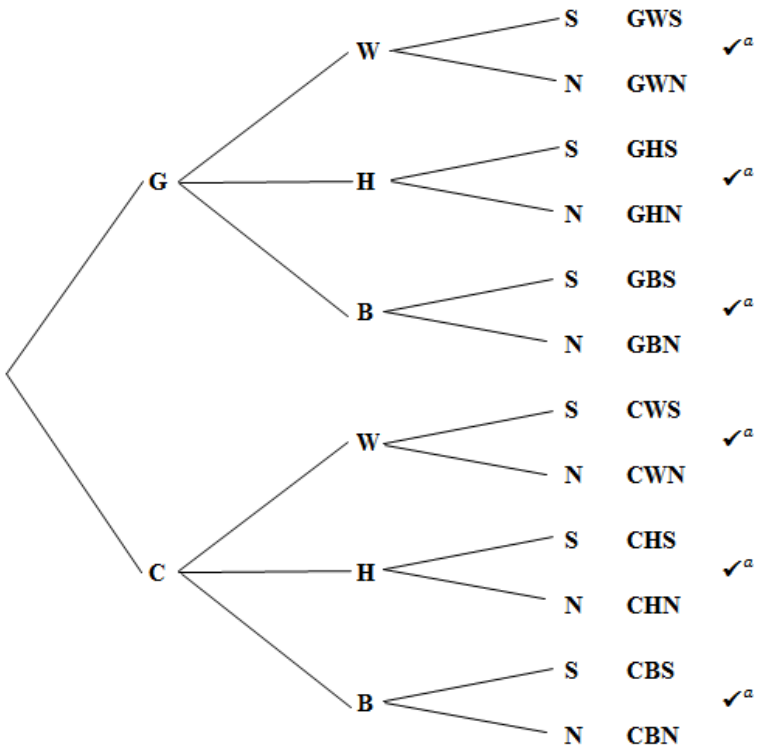
		MA	AT	TL
	QUESTION 2			
2.1.1	$A = P(1 + i)^n$ $A = 7\,000$ ✓a $\left(1 + \frac{0,883}{100}\right)^2$ ✓m $A = 7\,124,165$ … people $A = 7\,124$ ✓ca ∴ 7 124 – 7 000 ✓m = 124 people born ✓ca	5	F	2
2.1.2	$A = P(1 – i)^n$ $A = 7\,000$ ✓a $\left(1 – \frac{1,38}{100}\right)^2$ ✓m $A = 6808,13$ … people $A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

		MA	AT	TL
2.2.2	• Total Area $A = 150\ km^2$ • Holiday Resort $A = 2,5 \times 0,5$ $A = 1,25\ km^2$ ✓a • Dam $A = (3,14)(0,25$ ✓a$)^2 \times 2$ ✓m $A = 0,3925\ km^2$ ✓ca • Landing strip $A = 1,5 \times \frac{1}{4}$ $A = 0,375\ km^2$ ✓a Area left for cattle $= 150 - 1,25 - 0,3925 - 0,375$ ✓m $= 147,98255555\ km^2$ ✓ca ∴ Number of cattle farm can accommodate: $= 147,9825 \times 12,5$ ✓a $= 1\ 849,78$ ✓ca = 1 849 cattle ✓ca	10	M	4
2.3	See Answer Booklet ✓a✓a✓a✓a✓a Income and Expenses grouped correctly {Subtract 1 mark per incorrectly grouped account} **Calculation** Income: = 52 850 + 16 400 + 7 500 + 2 000 ✓m = R78 750 Expenses: R2 150 + R2 500 + R3 800 + R18 000 + R9 650 + R48 000 + R590 ✓m = R84 690 ∴ R78 750 – 84 690 ✓a = –R5 940 loss ✓ca Conclusion: Loss ✓ca	9	F	4

		MA	AT	TL
2.4.1	Learners may use a tree diagram. 1 mark per 2 combinations.  	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 ÷ 0,5 (One wire every 50 cm) = 6 + 1 (ground) = 7rows ✓[a] Perimeter = (20 + 0,5 + 0,5 ✓[a]) × 3 ✓[m] = 63 m ✓[ca] Total = 63 × 7 ✓[a] = 441 m ✓[ca] No. of rolls = 441 ÷ 5 ✓[m] = 88,2 = 89 rolls ✓[ca] Cost = 89 × 55 ✓[m] = R4 895 ✓[ca]	10	M	3
3.1.2	∴ Total Surface Area = $\frac{1}{2}(b \times \perp) \times 4$ = $\frac{1}{2}(21 \times 15) \times 4$ ✓[m] (correct subs.) = 630 m^2 ✓[ca] Cost = 630 × 670 ✓[m] = R442 100 ✓[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] $V = 2\ 198\ cm^3$ ✓[ca] **Nozzle** $V = (3{,}14)(0{,}4)^2\ (2)$ ✓[m] $V = 1{,}0048\ cm^3$ ✓[ca] Total Volume = 2 198 + 1,0048 ✓[m] = 2 199,0048 cm^3 ✓[ca] Number of litres required = 2 199,0048 ÷ 1 000 ✓[m] × 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 × 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 ÷ 100 000 = 24,8 km ✓[ca]	3	R	2
4.3.1	24,85 × 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 ÷ 9,2 ✓[m] = 1,13 litres ∴ 1,13 × 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] ∴ Bruce is correct. ✓[m]	4	D	4
4.4.4	21,1 km ÷ 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