education

Department:
Education
PROVINCE OF KWAZULU-NATAL

NATIONAL SENIOR CERTIFICATE

GRADE 11

MATHEMATICAL LITERACY P2

COMMON TEST

JUNE 2019

MARKS: 75

TIME: 1½ hours

This question paper consists of 7 pages and an addendum with 2 annexures.

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INSTRUCTIONS AND INFORMATION

1. This question paper consists of THREE questions. Answer ALL the questions.

2. Use the ANNEXURES in the ADDENDUM to answer the following questions:

   - Use ANNEXURE A for Question 1.1
   - Use ANNEXURE B for Question 2.2

3. Number the answers correctly according to the numbering system used in this question paper.

4. Start EACH question on a NEW page.

5. You may use an approved calculator (non-programmable and non-graphical) , unless stated otherwise.

6. Show ALL calculations clearly.

7. Round off ALL final answers appropriately according to the given context unless stated otherwise.

8. Units of measurement must be indicated where applicable.

9. Maps and diagrams are not necessarily drawn to scale, unless stated otherwise.

10. Write neatly and legibly.

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QUESTION 1

The Rand Show is an annual event in Gauteng. The Gumede family attended the 2019 show held from 19 April 2019 to 28 April 2019 at the Johannesburg Expo Centre in Nasrec.
The Gumede family, consisted of four adults, two pensioners and three children aged 16, 14 and 11.
TABLE 1 in ANNEXURE A shows the times and ticket prices for the 2019 Rand Show.

Use ANNEXURE A to answer the questions that follow.

1.1 Calculate the percentage discount for children under 17 and pensioners.

N.B: Percentage discount applies only to Early Bird Tickets and Peak Days.

You may use the formula: $\textbf{Percentage Discount} = \frac{\textbf{Discount Amount}}{\textbf{Peak Days' Price}} \textbf{ x 100\%}$ (3)

1.2 Calculate the total cost of the tickets (**NOT Early Bird Tickets**) if the family decided to visit the Gaming Entertainment Pavilion on the 26th of April. (4)

1.3 The 16-year-old child is in Grade 11, doing Mathematical Literacy. She argued that if the family had bought the Early Bird Tickets online (Computicket) for Monday the 22nd, they could have saved more than 30% on the total cost of the tickets.

Verify, showing ALL calculations, whether her statement is valid. (7)

1.4 The Gumede family planned to attend two Peak Day shows and one Off Peak Day show before driving back to Durban on the 28th of April. Their eldest son offered to pay for the shows. Calculate the total cost of the Early Bird tickets. (3)

1.5 Mr Gumede deposited R1,5 million into a fixed deposit account in February 2018 at 7,8% per annum compounded half yearly. Calculate the interest received at the end of 18 months. (7)

[24]

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QUESTION 2

2.1 Roberto is an immigrant worker from Chimoio in Mozambique. During the December holidays Roberto visits his wife and children in Mozambique. He prefers travelling by plane.
There are no direct flights from Johannesburg to Chimoio. Roberto takes his connecting flight in Beira. Direct flight from Johannesburg to Beira is 991 km.

2.1.1 Calculate the average speed (rounded off to the nearest km/h), of a passenger plane if it takes 100 minutes to fly directly to Beira.

You may use the formula: $\textbf{Speed} = \dfrac{\textbf{Distance}}{\textbf{Time}}$ (5)

2.1.2 The Boeing 747 uses 4 litres of fuel per second. Calculate the total amount of jet fuel used by a Boeing 747 to reach Beira. (4)

2.1.3 The fuel tank capacity of a Boeing 747 is 183 380 litres with an average fuel consumption of $12\ell/km$. Roberto told his friend at work that the plane can complete 8 return flights from Johannesburg to Beira without refuelling.

Verify, showing ALL calculations, whether Roberto's statement is correct. (7)

2.2 Annexure B shows a map of Mpumalanga province. Grade 11 learners from Ekwazini Secondary School in Middelburg are planning a trip to Volksrust when schools close on the 14th of June 2019.

N.B: The top numbers on the bar-scale on ANNEXURE B are kilometres (0, 20, 40 and 80) and the bottom numbers are miles (0, 29, 40 and 80).

Use ANNEXURE B to answer the questions that follow:

2.2.1 Measure the distance from Middelburg to Volksrust on the map and use the given scale to find the actual approximate distance. (5)

2.2.2 Give one disadvantage of using the bar scale. (2)

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2.3

When Roberto arrived home, his family was worried about his weight status. His children told him that he was overweight. For a fair conclusion on the matter, Roberto suggested that they use the Body Mass Index (BMI).

Given below is Roberto's height, weight and the BMI weight status table.

- Weight – 91 kg
- Height – 176 cm

BODY MASS INDEX GUIDELINES

BMI	WEIGHT STATUS
UNDER 18.5	Underweight
18.5 – 25	Normal (healthy) weight
25 – 30	Overweight
30 – 35	Obese Class I (Moderately Obese)
35 – 40	Obese Class II (Severely Obese)
OVER 40	Obese Class III (Very Severely Obese)

Source: www.wikipedia.org/wiki/Body_mass_index

Use the information above to answer the questions that follow.

2.3.1 Calculate Roberto's BMI (rounded off to the nearest whole number) and verify whether his children were correct.

You may use the formula: $\textbf{BMI} = \dfrac{\textbf{Weight in kg}}{\textbf{(height in m)}^2}$ (5)

2.3.2 Based on the weight status of Roberto in 2.3.1 above, what advice would you give to him? (2)

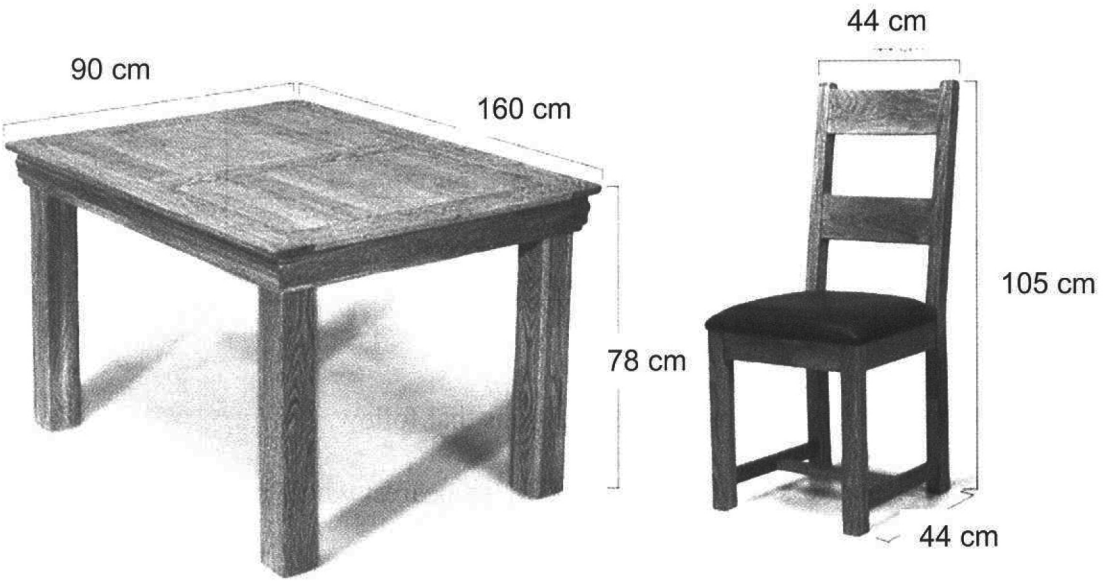
[30]

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QUESTION 3

3.1 Nkosinomusa is interested in pursuing interior design as a career. One of the skills that an interior designer needs to master is working with different scales or scale drawing.

The picture below shows the dining room table and a chair with actual dimensions.



Source: [www.google.com]

Refer to the picture and information above and answer the questions that follow.

3.1.1 If the length of the table on its scale drawing is 8 cm, determine the scale of the scale drawing in the form **1 : ...** . (2)

3.1.2 Use the scale in 3.1.1 above to write down the scale drawing of the dimensions of the chair. (4)

3.1.3 The maximum temperature of things placed on the wooden dining room table should not exceed 140°F.

Use the formula $°C = (°F - \mathbf{32}) \div \mathbf{1,8}$ to convert the temperature above to °C. (2)

3.2

Nkosinomusa's parents saw a 6-seater wooden dining room set similar to the one in Annexure C with a current (2019) cash price of R14 999.

Given below are the estimated inflation rates for 2019 to 2021.

- 2019 inflation rate is 5,27%
- 2020 inflation rate is 5,38%
- 2021 inflation rate is 5,50%

Source:[https://www.statista.com/statistics/370515/inflation-rate-in-south-africa/]

3.2.1 Calculate the 2018 cash price of the dining room set, given that the 2019 price includes the 5,27% inflation rate.

You may use the formula: $\textbf{2018 Price} = \dfrac{\textbf{2019 Price}}{\textbf{105,27\%}}$ (3)

3.2.2 Show by calculation how the price of the dining room set above will be affected by inflation in 2020. (3)

3.2.3 Nkosinomusa's father argues that for him to be able to buy the same dining room set in 2021, his salary must increase by at least 11,18%.

Use the current cash price of R14 999 and the price of the dining room set in 2021 to verify the father's claim. (7)

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TOTAL MARKS: 75

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ADDENDUM

JUNE 2019

NB: This addendum consists of 3 pages with 2 annexures.

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ANNEXURE A

Question 1.1

TICKET PRICE FOR THE 2019 RANDSHOW

Pavilion Times (Gaming)		**TICKET PRICES (Incl. 15% VAT)**		
Peak	Off Peak	Age Category	Peak Days 19, 20, 21, 22, 27 & 28	Off Peak Days 23, 24, 25 & 26
10 h 00 12 h 15 14 h 30 16 h 45	14 h 00 16 h 15	Adults (17 +)	R150	R80
		Children (under 17)	R80	R40
		Pensioners	R80	R40
		Children (under 1m height)	FREE	FREE
Friday 19 April to 28 April		Discount of 33,33% for Adults when they buy Early Bird Tickets.		

N.B: A Gaming Entertainment Pavilion Ticket costs an additional **R20 per ticket** more than the Entry Only Ticket.

Entry Only Ticket does not include entry to the Gaming Entertainment Pavilion.

Peak Days: Doors open from **10 h 00 to 19 h 00** each day.

Off Peak Days: Doors open from **12 h 00 to 19 h 00** each day.

Early Bird Discounts apply for Peak Days ONLY and are as follows:

- Adults R100
- Children under 17 R50
- Pensioners R50

Early Bird Tickets include entry to the Gaming Entertainment Pavilion.

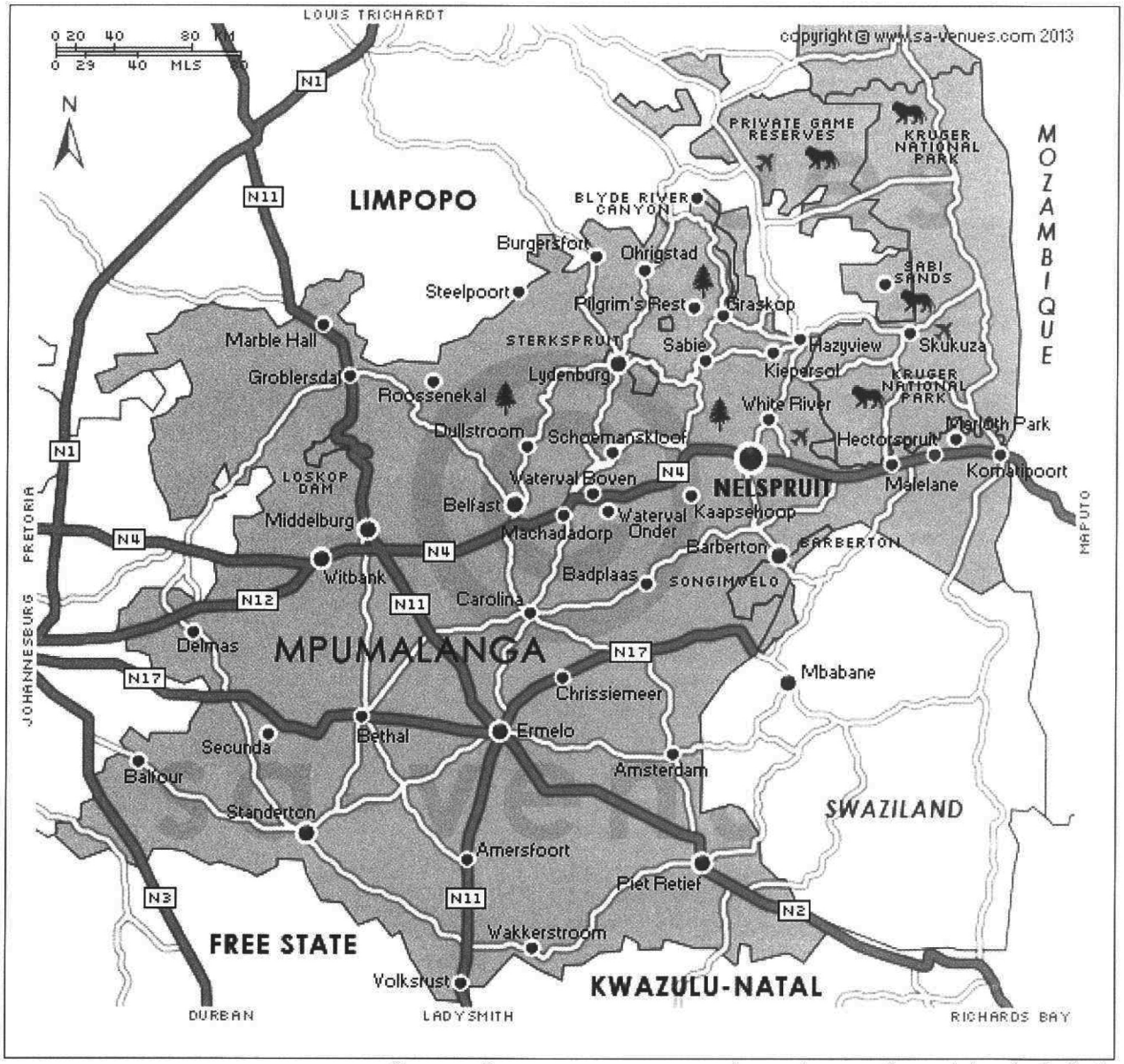
Source: [www.randshow .co.za]

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ANNEXURE B

Question 2.2

Map of Mpumalanga Province



Source: [www.sa-venues.com/maps/mpumalanga/physical.php]

N.B: Take note of the following about the bar-scale on the map above.

- **0, 20, 40 and 80 are kilometres (top numbers on the scale are km)**
- **0, 29, 40 and the last number 80 are miles (bottom numbers on the scale are miles)**

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MLIT P2' GR11 & GR10.

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MARKING GUIDELINES

MARKS: 75

Symbol	Explanation
M	Method
M/A	Method with Accuracy
CA	Consistent Accuracy
A	Accuracy (Answer)
AO	Answer only full marks
C	Conversion
S	Simplification
RT / RG / RM/RP	Reading from table / Reading from graph / Reading from map/Reading from plan
F	Choosing the correct formula
E	Explanation
D	Correct definition
SF	Substitution in formula
O	Opinion
J	Justification
P	Penalty e.g. for no units, incorrect rounding, etc
R	Rounding off / Reason

This marking guideline consists of 4 pages.

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QUESTION 1 [27 MARKS]

Question	Solution	Explanation	T & L
1.1	Percentage discount $= \frac{R30✓MA}{R80✓M} \times 100\%$ $= 37,5\%✓A$	1MA for discount amount 1 M for dividing by 80 1A correct answer (3)	F L2
1.2	Total Cost $= 4(R80 + 20) + 5(R40 + 20)✓✓M$ $= R400 + R300✓S$ $= R700✓A$	1M for adding R20 per person 1M for multiplying by 4 and 5 1S simplification 1A correct answer (4)	F L2
1.3	Normal Cost $= 4(R150) + 5(R80)✓MA$ $= R1000✓A$ Early Bird Cost $= 4(R100) + 5(R50)✓MA$ $= R650✓A$ $= R1000 - R650$ $\frac{R350✓M}{R1000} \times 100\% = 35\%✓CA$ Her statement is correct✓O	1MA addition for Peak Day cost 1A normal cost 1MA addition Early Bird cost 1A Early Bird cost 1M subtracting R650 from R1000 1CA for 35% 1O correct conclusion (7)	F L4
1.4	Early Bird Cost $= 4(R100) + 5(R50)✓M$ $= R650✓M$ Cost for 2 Early Bird Tickets = R1 300✓A	1M for multiplying by 4 and 5 1M for R650 1A for the correct answer R1300 (3)	F L2
1.5	Interest rate for half year is $\frac{7,8\%}{2✓M} = 3,9\%✓M$ First 6 months: Interest $= 3,9\% \times R1\ 500\ 000✓M$ $= R58\ 500✓CA$ Second 6 months: Interest $= 3,9\% \times R1\ 558\ 500$ $= R60\ 781,50✓CA$ Last 6 months: Interest $= 3,9\% \times R1\ 619\ 281,50$ $= R63\ 151,98✓CA$ $= R58\ 500 + R60\ 781.50 + R63\ 151,98$ Total Interest = R182 433,48✓CA	1M division by 2 1M for 3,9% 1M multiplying 3,9% by R1 500 000 1CA for interest 1st 6 months 1CA for interest 2nd 6 months 1CA for interest 3rd 6 months 1CA for total interest (7)	F L3
		[24]	

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QUESTION 2 [30 MARKS]		Explanation	T/L
2.1.1	60 minutes = 1hour 100 minutes = $\frac{100}{60}$ ✓M = 1,66666✓C Speed = $\frac{991}{1,6666}$ ✓SF = 594,62 km/h✓A ≈ 595 km/h✓R	1M for dividing by 60 1C converting hours to minutes 1SF justification 1A correct answer 1R rounding off (5)	M L3
2.1.2	100 minutes = 100 × 60 seconds✓M = 6 000 seconds✓C Number of litres = 6 000 × 4l✓M = 24 000l✓CA	1M multiplying 100 by 60 1C conversion to seconds 1M multiplying 6000 by 4 1CA consistent accuracy (4)	M L3
2.1.3	Fuel for 991 km = 991 × 12l✓M = 11 892l✓S Fuel for return flight = 2 × 11 892l✓M = 23 784✓M Number of return flights = $\frac{183\ 380}{23\ 784✓M}$ = 7,71✓CA Roberto's statement is not true. ✓J	1M multiplying 991 by 12 1S simplification 1M multiplying by 2 1M return flight fuel 1M dividing by 23 784 1CA number of return flights 1J verification (7)	M L4
2.2.1	distance on the map is 6,7 cm✓A (accept 6,5 – 6,9) 2,8 cm = 80km ✓A $\frac{6,7 \times 80}{2,8}$ ✓M =191,43 km ✓CA **OR** distance on the map is 6,7 cm✓A (accept 6,5 – 6,9) 2 cm = 80 miles $\frac{6,7 \times 80}{2}$ ✓M ✓A = 268 miles ✓CA	1A distance on the map 1A distance on bar scale 1M multiplying by 80 1M dividing by 2,8 1CA for distance **OR** 1A distance on the map 1A distance on bar scale 1M multiplying by 80 1M dividing by 2 1CA for distance (5)	M L3
2.2.2	It is not accurate, values are estimated✓✓O	2O disadvantage (2)	4
2.3.1	176 cm = 1,76 m✓C BMI = $\frac{91✓M}{(1,76)^2✓M}$ = 29,38✓A The children were correct✓O	1C converting 176 cm to metres 1M for 91 kg 1M dividing the square of 1,76 1A correct answer 1O correct conclusion (5)	M L4
2.3.2	Physical exercise/Change of diet✓✓O	2O proper advice (2)	M L4
			[30]

QUESTION 3 [21 MARKS]		Explanation	T/L
3.1.1	8 : 160 ✓M = 1 : 20✓S	1M for the ratio 8 : 160 1S simplifying (1 : 20) **AO (1 : 20)** (2)	M L2
3.1.2	length = width = $\frac{44}{20}$ ✓M = 2,2 cm✓A height = $\frac{105}{20}$ ✓M = 5,25 cm✓A	1M for dividing 44 by 20 1A correct length and width 1M for dividing 105 by 20 1A correct height (4)	M L3
3.1.3	°C = (140°F – 32) ÷ 1,8✓SF = 60✓A	1SF correct substitution 1A correct answer (2)	M L2
3.2.1	105,27% = 1,0527✓M 2018 Price = $\frac{\text{R14 999}}{1,0527}$ ✓SF = R14 248,12✓CA	1M for 1,0527 1SF correct substitution 1CA correct answer/accuracy (3)	F L3
3.2.2	5,38% of R14 999 = R806,95✓M 2020 Price = R14 999 + R806,95✓M = R15 805,95✓CA	1M for the increase of R806,95 1M addition 1CA correct answer/accuracy (3)	F L2
3.2.3	5,50% of R15 805,95 = R869,33✓M 2021 Price = R15 805,95 + R869,33✓M = R16 675,28✓A Average increase from 2019 = R1 676,28✓M Average Percentage Increase = $\frac{\text{R1 676,28}}{\text{R14 999}}$ × 100%✓SF = 11,18✓CA The father is correct✓O	1M for the increase of R869,33 1M addition 1A for R16 675,28 1M for average increase 1SF correct substitution 1CA correct answer/accuracy 1O correct opinion (7)	F L4
			[21]

TOTAL :75