Inside Education
Inspiring Minds

MATRIC EXAM REVISIONS

MATHEMATICAL LITERACY PAPER 2 (2019)

QUESTION PAPER

basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P2

NOVEMBER 2019

MARKS: 150

TIME: 3 hours

This question paper consists of 11 pages and an addendum with 5 annexures.

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INSTRUCTIONS AND INFORMATION

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

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

   ANNEXURE A for QUESTION 1.1
   ANNEXURE B for QUESTION 1.3
   ANNEXURE C for QUESTION 2.2
   ANNEXURE D for QUESTION 2.4
   ANNEXURE E for QUESTION 3.5

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. Indicate units of measurement, where applicable.

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

10. Write neatly and legibly.

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QUESTION 1

1.1 An annual agricultural show is held at NAMPO Park in the Free State in May. Farmers and other interested people visit this show to see the latest developments in farming.

ANNEXURE A shows the route map to NAMPO Park.

Use ANNEXURE A to answer the questions that follow.

1.1.1 Name the TWO towns closest to NAMPO Park. (2)

1.1.2 Give the TWO general compass directions that a visitor must use to travel by car from OR Tambo Airport, via Klerksdorp, to reach NAMPO Park. (4)

1.1.3 The distance from Bloemfontein to Welkom is 152 km and the distance from Bloemfontein to Bultfontein is 100 km.

Determine, with calculations, the route the organisers used to indicate the distance from Bloemfontein to NAMPO Park. (3)

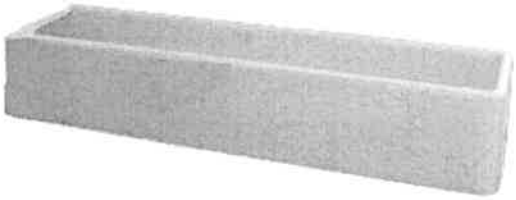
1.1.4 Alfred departs from NAMPO Park at 18:45 and travels to Sasolburg at an average speed of 88 km/h. He calls his wife to inform her that he will arrive in Sasolburg at 8 pm.

Verify, with calculations, whether his timing is correct.

You may use the formula:

Distance = speed × time (6)

1.2 There are rectangular prism-shaped water troughs for cattle on display. The troughs are made of concrete, as shown in the picture below.

PICTURE OF A CONCRETE TROUGH	OUTER DIMENSIONS OF A TROUGH
	Length = 3 m Width = 685 mm Height = 40 cm

Volume of a rectangular prism = length × width × height

NOTE:
- A trough is a long, narrow, open container for animals to drink from.
- 1 ℓ = 1 000 cm^3

Use the information above to answer the questions that follow.

1.2.1 Calculate, in cm^3, the volume of concrete used to make this trough if the trough can hold a maximum of 485 ℓ of water. (7)

1.2.2 A cow drinks 56 ℓ of water per day. Alfred stated that a full trough has enough water for 8 cows per day.

Verify, with calculations, whether this statement is CORRECT. (3)

1.2.3 Determine how long, to the nearest minute, it will take to fill a half empty trough if the water flows in at a rate of 14,5 ℓ per minute. (3)

1.3 ANNEXURE B shows the floor plan of one of the exhibition halls at NAMPO Park, with distances given in metres.

Use ANNEXURE B to answer the questions that follow.

1.3.1 Determine the approximate distance from stand 14 to the nearest rolling door. (2)

1.3.2 Measure the distance from the beginning of stand 10 to the end of stand 17 and hence, determine, to ONE decimal place, the scale of this plan. (4)

1.3.3 The exhibitor's rate for a 4 m × 4 m stand is R22 942.

Cyril stated that he must pay exactly R25 000 for stand 26.

Verify, showing ALL calculations, whether this statement is valid. (5)
[39]

QUESTION 2

2.1

According to the SARS data for December 2017, South Africa's 148 266 millionaires earn between R1 million and R2 million per annum.

The number of millionaires increased by 5,0065% compared to the previous year. The total annual taxable income for ALL the millionaires was R287,24 billion.

[Source: *SARS Statistics*, released December 2017]

Use the information above to answer the questions that follow.

2.1.1 It was stated that the mean monthly income per millionaire is exactly R161 000.

Verify, with calculations, whether this statement is CORRECT. (5)

2.1.2 Calculate the number of millionaires in South Africa in the previous year (2016). (3)

2.2

ANNEXURE C shows the tax rates for individuals for the 2018/2019 tax year. John (68 years old) received a taxable income of R2 045 364 for the 2018/2019 tax year. He paid a monthly contribution towards a medical scheme for himself and his wife.

Use the information above and ANNEXURE C to answer the questions that follow.

2.2.1 Calculate John's total medical scheme tax rebate for the year. (3)

2.2.2 Hence, calculate the amount of income tax he had to pay for the 2018/2019 tax year. (8)

2.3

John's daughter, Megan, works in Denmark. She earns an annual gross salary of Kr600 000 (Kr is the unit for Danish kroner.) She informed her father that she had the following annual deductions from her salary:

- Kr229 760 for investment policy
- Kr48 000 for labour market contribution
- Kr37 200 for employment deduction

Use the information above to answer the questions that follow.

2.3.1 Calculate, in rand, Megan's annual gross salary using the following exchange rates:

1 euro = 15,64 South African rands
1 euro = 7,47 Danish kroner

(4)

2.3.2 John stated that Megan's total annual deductions (excluding tax) are more than 52% of her annual gross salary.

Verify, showing ALL calculations, whether this statement is valid. (4)

2.4 TABLE 1 on ANNEXURE D shows the top marginal tax rate for individuals in the G20 countries. This table provides present and past data of the top marginal tax rates. It was updated in January 2019.

Use the information in ANNEXURE D to answer the questions that follow.

2.4.1 Name the country that has the biggest range between 2019 and the past top marginal tax rates. (2)

2.4.2 Determine, to THREE decimal places, the probability of randomly selecting one of the G20 countries where the latest tax rates changed from the previous tax rate. (3)

2.4.3 Use the 2019 top marginal tax rate and answer the following questions:

(a) Determine quartile 2 (2)

(b) The interquartile range is given as 12.

Verify, showing ALL calculations, whether the given interquartile range is CORRECT. (4)
[38]

QUESTION 3

3.1 Franco is training to become a pilot. The following shows the approximate cost to get a private pilot's licence:

- 28 hours' flying with an instructor @ R2 050 per hour
- 18 hours' solo flying at a total cost of R31 050
- 15 hours' theory lessons costing R1 242 per 3-hour lesson
- 2-hour ground evaluation test costing R700
- Flying-kit including notes costing R6 544
- 7 examinations @ R190 per examination

NOTE: Solo flying means to fly the airplane on your own.

[Adapted from businesstech.co.za]

3.1.1 Calculate, in rand per minute, the rate for solo flying. (3)

3.1.2 Calculate the total approximate cost to get a private pilot's licence. (5)

3.2 Two years ago Franco had invested R90 000 at an interest rate of 8,5% per annum compounded yearly.

Verify, with calculations, whether this total amount with interest is enough to pay for a private pilot's licence. (6)

3.3 Franco noted that not all the students passed the examinations.

TABLE 2 and TABLE 3 show information regarding the same group of students that sat for the examinations. All students that failed, attempted the examinations again.

3.3.1 TABLE 2 below shows information regarding the percentage of students that passed or failed the examinations.

TABLE 2: PASS OR FAIL RATE PER ATTEMPT

	1ST ATTEMPT	2ND ATTEMPT
Failure rate	80%	70%
Pass rate	20%	30%

Give a possible reason why the probability of passing increased after the first attempt. (2)

3.3.2 TABLE 3 below shows the actual numbers of students listed in TABLE 2 that sat for the examinations. Some values have been omitted.

TABLE 3: TOTAL NUMBER OF STUDENTS AND RESULTS

	FAIL	PASS	TOTAL
1st attempt	**A**	24	**B**
2nd attempt	67	**D**	**C**

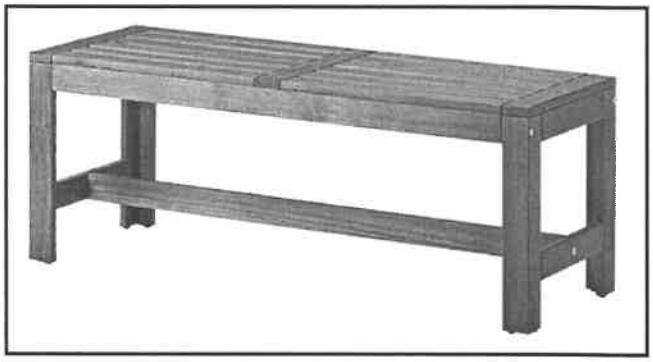
Determine, showing ALL calculations, the missing values **A**, **B**, **C** and **D** to calculate the total number of students that passed after both attempts. (6)

3.4 Franco's flying instructor has completed 26 000 hours of flying. It was stated that these hours can be converted to 154 weeks, 5 days and 8 hours of flying.

Verify, showing ALL calculations, whether this statement is valid. (5)

3.5 Franco assembles benches for their flying field. The benches are sold as loose parts contained in a box, ready to be assembled.

PICTURE OF AN ASSEMBLED BENCH



ANNEXURE E has the list of parts and the first THREE assembly illustrations.

Use ANNEXURE E to answer the questions that follow.

3.5.1 Write down the total number of loose parts in a box. (2)

3.5.2 Write down TWO instructions that will match the illustration in step 2. (4)

3.5.3 Explain the purpose of the long panel. (2)
[35]

QUESTION 4

4.1 The Republic of South Africa (RSA) conducts household censuses to collect information. The next census will take place in 2021.

Census information regarding household size is shown below.

HOUSEHOLD SIZE

HOUSEHOLD SIZE	CENSUS 1996	CENSUS 2001	CENSUS 2011
One	16%	19%	27%
Two	17%	18%	19%
Three	15%	15%	15%
Four	15%	15%	14%
Five or more	36%	33%	25%
Total number of households	**8,7 million**	**10,8 million**	**14,5 million**

[Source: statssa.gov.za]

NOTE:

- A census is an official count or survey.
- According to Stats SA, a household consists of a single person or a group of people who live together for at least four nights a week, who eat together and who share resources.

Use the data above to answer the questions that follow.

4.1.1 Determine the percentage increase in the total number of households from 2001 to 2011. (3)

4.1.2 State which household size matches EACH of the following trends:

(a) Increased every year, but only by a small percentage (2)

(b) Remained constant in every census from 1996 to 2011 (2)

4.1.3 It was stated that the percentage of households with five or more persons decreased from 2001 to 2011, therefore the number of households with five or more persons **decreased** by 0,060 million.

Verify, showing ALL calculations, whether this statement is CORRECT. (5)

4.1.4 Explain why the percentages for the 1996 census do not add up to 100%. (2)

4.1.5 Write down the probability of randomly choosing a household from the 2011 census with a household size fewer than four persons. (3)

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4.2 The information below shows the per capita income of households in South Africa in 2011.

HOUSEHOLDS IN SOUTH AFRICA		
INCOME PER CAPITA PER DAY		**NUMBER OF HOUSEHOLDS**
R280 and more		11% 1,4 million
R80 to R279		24% 3,1 million
R20 to R79		41% 5,4 million
Less than R20		24% 3,2 million

[Source: Household survey 2011]

NOTE: Children under 10 years of age count as half a person for per capita calculations.

4.2.1 Write down the modal class for the income per capita per day. (2)

4.2.2 Determine the total number of households with a per capita income of less than R80 per day. (2)

4.2.3 The Wong Family has the following income per person:

- Mr Wong: R276 000 per year
- Mrs Wong: R541 500 per year

Calculate the Wong household income per capita per day if they have 2 children, aged 15 and 8 years old.

You may use the formula:

$$\textbf{Per capita income} = \frac{\textbf{Total income per household}}{\textbf{Household size}}$$ (6)

4.2.4 A household with an income of R280 per capita per day spends 4% of their income on cellphones.

Determine the total amount spent by this household on cellphones per year. (3)

4.3 TABLE 4 below shows the number of households that have access to amenities (services) in their houses. Some of the data have been omitted.

TABLE 4: NUMBER OF HOUSEHOLD WITH ACCESS TO AMENITIES FOR SELECTED YEARS

	2001	2007	2011	2016
Flush toilets	5,8 million 53%	7,2 million 58%	8,7 million 60%	10,7 million ...
Tap water	6,9 million 62%	8,7 million 69%	10,6 million 73%	14,3 million 84,5%
Electricity	7,8 million 70%	10,0 million 80%	12,2 million 85%	14,8 million ...
Total households		**H**	14 450 161	16 923 309

[Source: Census 2001, 2011 and Community survey 2007 and 2016]

Use the information in the table above to answer the questions that follow.

4.3.1 To determine **H** in the table, two learners provided the following calculations:

IAN	NEO
$H = \frac{10{,}0\text{ million}}{80} \times 100$ $= 12{,}5\text{ million}$	$H = \frac{10{,}0\text{ million}}{100} \times 80$ $= 8\text{ million}$

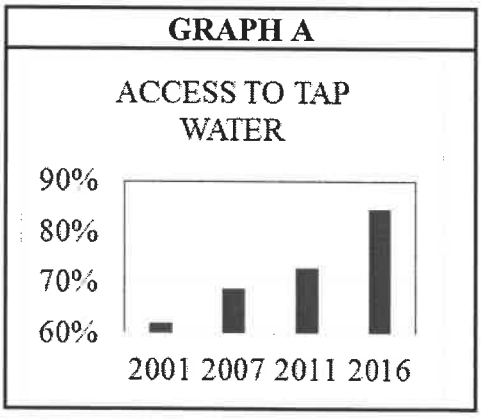
Give the name of the person whose answer was INCORRECT. (2)

4.3.2 The average expenditure on electricity per household was R125 per month and for tap water R98 per month.

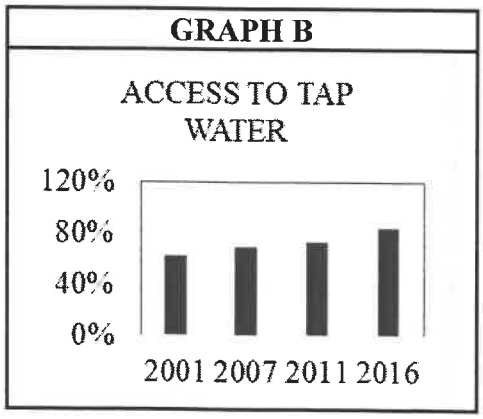
Calculate, in millions, the total that was spent by all the households on electricity and tap water in 2011. (4)

4.3.3 The graphs below show the same data for the number of households that have access to tap water.

GRAPH A



GRAPH B



Give ONE reason for the difference in the length of the bars for each of the graphs. (2)

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TOTAL: 150

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MATRIC EXAM REVISIONS

MATHEMATICAL LITERACY PAPER 2 (2019)

ANSWER PAPER

basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE
NASIONALE SENIOR SETIFIKAAT

GRADE/*GRAAD* 12

MATHEMATICAL LITERACY P1/
WISKUNDIGE GELETTERDHEID V1

NOVEMBER 2019

MARKING GUIDELINES/*NASIENRIGLYNE*

MARKS/*PUNTE*: 150

Symbol/*Kode*	Explanation/*Verduideliking*
M	Method/*Metode*
MA	Method with accuracy/*Metode met akkuraatheid*
CA	Consistent accuracy/*Volgehoue akkuraatheid*
A	Accuracy/*Akkuraatheid*
C	Conversion/*Herleiding*
S	Simplification/*Vereenvoudiging*
RT	Reading from a table/graph/document/diagram/*Lees vanaf tabel/grafiek/dokument/diagram*
SF	Correct substitution in a formula/*Korrekte vervanging in 'n formule*
O	Opinion/Explanation/*Opinie/Verduideliking*
P	Penalty, e.g. for no units, incorrect rounding off, etc./*Penalisasie, bv. vir geen eenhede, verkeerde afronding, ens.*
R	Rounding off/*Afronding*
NPR	No penalty for rounding/*Geen penalisasie vir afronding nie*
AO	Answer only/*Slegs antwoord*
MCA	Method with consistent accuracy/*Metode met volgehoue akkuraatheid*
RCA	Rounding consistent with accuracy/ *Afronding met volgehoue akkuraatheid*

This marking guideline consists of 18 pages and 2 pages of notes.
Hierdie nasienriglyne bestaan uit 18 bladsye en 2 bladsye notas.

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NOTE:
- If a candidate answers a question TWICE, only mark the FIRST attempt.
- If a candidate has crossed out (cancelled) an attempt to a question and NOT redone the solution, mark the crossed out (cancelled) version.
- Consistent accuracy (CA) applies in ALL aspects of the marking guidelines; however it stops at the second calculation error.
- If the candidate presents any extra solution when reading from a graph, table, layout plan and map, then penalise for every extra item presented.
- The general principle of marking is that if a candidate makes one mistake and there is sound mathematics thereafter, the candidate loses one mark.

LET WEL:
- *As 'n kandidaat 'n vraag TWEE KEER beantwoord, sien slegs die EERSTE poging na.*
- *As 'n kandidaat 'n antwoord van 'n vraag doodtrek (kanselleer) en nie oordoen nie, sien die doodgetrekte (gekanselleerde) pogin na.*
- *Volgehoue akkuraatheid (CA) word in ALLE aspekte van die nasienriglyne toegepas, dit hou by die tweede berekeningsfout op.*
- *Wanneer 'n kandidaat aflesings vanaf 'n grafiek, tabel, uitlegplan en kaart geneem en ekstra antwoorde gee, penaliseer vir elke ekstra item.*
- *Die algemene beginsel van merk is as 'n leerder een fout maak verloor die leerder een punt.*

QUESTION/*VRAAG* 1 [30 MARKS/*PUNTE*] AO			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T&L**
1.1.1	Numerical data/*Numeriese data* ✓✓A	2A correct identification (2)	D L1
1.1.2	Modal allowance/*Modale toelaag* = R1 780 ✓✓A	2A mode (2)	D L1
1.1.3	R1 715; R1 715; R1 695; R1 695; R1 695; R960; R405 ✓✓A	2A descending order Accept the names (2)	D L1
1.1.4	Increase in rand/*Verhoging in rand* ✓RT R1 780 – R1 695 = R85,00 ✓A	1RT correct 2 values 1A simplification (2)	F L1
1.1.5	Pension allowances older than 75 ✓A *Staatsouderdomstoelae ouer as* 75 War veteran allowances/*Oorlogsveteranetoelae/Toelaes vir oorlogsveterane* ✓A	1A correct allowance 1A correct allowance (2)	D L1

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Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T&L
1.2.1	1 kg = 1 000 g ? = 400 g ∴ Quantity/ *massa* in kg = $\frac{400\,g}{1000}$ ✓MA = 0,4 kg ✓A **OR/*OF*** 400 g = $\frac{400}{1\,000}$ kg ✓MA = 0,4 kg ✓A **OR/*OF*** 400 g = 400 × 0,001kg ✓MA = 0,4 kg ✓A	1MA dividing by 1 000 1A amount in kg **OR/*OF*** 1MA dividing by 1 000 1A amount in kg **OR/*OF*** 1MA multiply by 0,001 1A amount in kg **NPU** (2)	M L1
1.2.2	✓RT Profit/*Wins* = R14,30 – R10,99 ✓M = R3,31 ✓CA	1RT correct values 1M subtracting values 1CA simplification (3)	F L1
1.2.3	Number of packets/*Getal pakkies* 2,5 kg × $\frac{1000}{250}$ ✓MA ✓M = 10 packets/*pakkies* ✓CA **OR/*OF*** $\frac{2,5\,kg}{0,25\,kg}$ ✓C ✓M = 10 packets ✓CA **OR/*OF*** 250g : 2,5kg ✓MA 250g : 2500g ✓C 1: 10 = 10 packets ✓CA	1MA multiply by 1 000 1M dividing by 250g 1CA simplification **OR/*OF*** 1C converting into kg 1M dividing by 0,25 kg 1CA simplification **OR/*OF*** 1MA ratio concept 1C conversion to same unit 1CA simplification (3)	M L1

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T&L
1.2.4	Selling price/*Verkoopsprys* $\frac{R29,20}{8}$ ✓MA =R3,65 ✓CA **OR/*OF*** $\frac{2\,kg}{8} = 0,25kg$ ∴ 2kg = R29,20 0,25 kg = $\frac{0,25 \times R29,20}{2}$ ✓MA = R3,65 ✓CA	1MA dividing correct value by 8 1CA simplification (only if dividing by 8 or correct value used) **OR/*OF*** 1MA dividing by 2 AND multiply by 0,25 1CA simplification (2)	F L1
1.3.1 (a)	69 **OR/*OF*** 69% ✓✓A	2A correct value (2)	D L1
1.3.1 (b)	80 **OR/*OF*** 80% ✓✓A	2A correct value (2)	D L1
1.3.2	Difference/*Verskil* ✓RT 84% – 64% = 20% ✓CA	1RT both correct values 1CA simplification (2)	D L1
1.4.1	16:00 **OR/*OF*** four o'clock in the afternoon/*vier uur in die middag* **OR/*OF*** 4 pm/*nm* ✓A	2A correct value (2)	D L1

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T&L
1.4.2	Probability/*Waarskynlikheid* = 20% **OR/*OF*** 0,2 **OR/*OF*** $\frac{20}{100}$ **OR/*OF*** $\frac{2}{10}$ **OR/*OF*** $\frac{1}{5}$ **OR/*OF*** unlikely/*onwaarskynlik* **OR/*OF*** less likely/*minder waarskynlik* ✓✓A	2A correct value/words (2)	P L1
		[30]	

QUESTION/*VRAAG* 2 [42 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T&L**
2.1.1	Market value/*Markwaarde* = R944 630,00 Nine hundred and forty four thousand six hundred and thirty rand. ✓✓A *Negehonderd vier en veertig duisend ses honderd en dertig rand.*	2A correct value in words **NPU** (2)	F L1
2.1.2	Amount of VAT/*Bedrag vir BTW* R836,02 × $\frac{15}{100}$ ✓MA = R125,40 ✓CA **OR/*OF*** R836,02 × 1,15 ✓MA = R961,42 R961,42 – R836,02 = R125,40 ✓CA	1MA correct value × $\frac{15}{100}$ 1CA simplification **OR/*OF*** 1MA correct value × 1,15 1CA simplification (2)	F L1
2.1.3	Litres/*liter* **OR/*OF*** ℓ ✓✓A	2A correct unit Accept dm^3 (2)	F L1
2.1.4	Monthly sewer charge/*Maandelikse rioolverwyderingskoste* **A** = R378,95 ✓✓A	2A correct charge (2)	F L1
2.1.5	Total water charge/*Totale water koste* ✓MA ✓RT **B** = (6 × R8,28) + (4 × R8,79) + (2 × R15,00) = R49,68 + R35,16 + R30,00 ✓M = R114,84 ✓CA	1MA identify 6, 4, 2 1RT identify R8,28; R8,79; R15,00 1M adding (at least 2 correct values) 1CA simplification (4)	F L2
2.2.1	Inverse proportion/Omgekeerde eweredigheid ✓✓A **OR/*OF*** Indirect proportion /*Indirekte eweredigheid*	2A type of proportion (2)	F L1

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T&L
2.2.2	6 ✓✓A	2A correct number (2)	F L1
2.2.3	Amount per person/*Bedrag per persoon* ✓RT $= \frac{R3\,000,00}{7}$ ✓MA = R428,57 ✓CA	1RT correct cost (R3 000) 1MA dividing by 7 1CA simplification (3)	F L1
2.2.4 (a)	$\frac{R17\,000,00}{R500,00}$ ✓MA = 34 months/*maande* ✓CA	1MA dividing by R500,00 1CA simplification **AO** (2)	F L1
2.2.4 (b)	Interest rate/*Rentekoers* = 8,30% ✓✓A	2A correct interest rate (2)	F L1
2.2.4 (c)	Interest for 1 year/*Rente vir 1 jaar* = R17 000,00 × $\frac{8,30}{100}$ ✓M Interest for 3 years/*Rente vir 3 jaar* = R1 411,00 × 3 = R4 233,00 ✓CA = R4 200,00 ✓R **OR/*OF*** Interest earned for 3 years /*Rente verdien vir 3 jaar* R17 000,00 × $\frac{8,30}{100}$ × 3 ✓M = R4 233,00 ✓CA = R4 200,00 ✓R	**CA from Question 2.2.4 (b)** 1M interest calculation 1CA simplification 1R rounding **OR/*OF*** 1M interest calculation 1CA simplification 1R rounding (3)	F L2
2.2.4 (d)	Percentage point difference/*Persentasiepunte verskil* 8,46% − 7,76% ✓RT = 0,7% ✓CA	1RT correct values 1CA simplification **AO** (2)	F L1

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T&L
2.2.4 (e)	✓RT 18 months/*maande* ✓A ✓A = 1 year and 6 months/*1 jaar en 6 maande*	1RT reading from table 1A number of years 1A number of months **AO** (3)	F L1
2.3.1	✓RT R242 700 million/*miljoen* ✓A **OR/*OF*** ✓RT R242 700 000 000 ✓A	1RT correct value (2 427) 1A number in millions **NPU** (2)	F L1
2.3.2	Total income received/*Totale inkomste ontvang*: 1 370 + 242,7 + 180,3 + 31,5 ✓MA **A** = 1 824,5 ✓CA	1MA adding ALL correct values 1CA simplification **NPU** (wrote billions or rands) **AO** (2)	F L1
2.3.3	Other/*Ander* ✓RT 1 823,72 – (278,4+262,4+222,6+211,0 +209,2+208,5+ 202,2 +112,7) ✓M **B** = 1 823,72 – 1 707 ✓MA = 116,72 ✓CA	1RT reading correct values 1M adding all the values 1MA subtracting from total 1CA value of B **NPU** (4)	F L2
2.3.4	Community development/*Gemeenskapsontwikkeling* ✓RT $= \frac{R208,5}{R1\,823,72} \times 100\%$ ✓M = 11,43267607% ✓CA ***ACCEPT ONLY FOR AFRIKAANS CANDIDATES:*** Social development/*Maatskaplikesontwikkeling* ✓RT $= \frac{R278,4}{R1\,823,72} \times 100\%$ ✓M = 15,26550128% ✓CA	1RT both correct values 1M percentage calculation 1CA simplification 1RT both correct values 1M percentage calculation 1CA simplification **NPR** (3)	F L2
		[42]	

QUESTION/*VRAAG* 3 [26 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T&L**
3.1.1	Volume = It is the amount of solids or liquids an object can take/hold. *Volume = Is die hoeveelheid vaste of vloeistowwe 'n voorwerp kan vat.* ✓✓A **OR/*OF*** Volume is the amount of space occupied by an object *Volume is die hoeveelheid spasie opgeneem deur die voorwerp.*	2A explanation (2)	M L1
3.1.2	Volume = side × side × height/*sy* × *sy* × *hoogte* ✓C = 0,5 m × 0,5 m × 0,08 m ✓SF = 0,02 m^3 ✓CA **OR/*OF*** $\frac{20\,000\,cm^3}{1\,000\,000}$ ✓SF 50 cm × 50 cm × 8 cm = 0,02 m^3 ✓C ✓CA	1SF correct substitution 1C conversion 1CA simplification **OR/*OF*** 1 SF correct substitution 1C conversion 1CA simplification (3)	M L2
3.2.1	Area of one block = length × breadth = 50 cm × 50 cm ✓SF = 2 500 cm^2 Area of 12 blocks = 0,25 m^2 × 12 ✓MA = 3 m^2 ✓CA **OR/*OF*** Area of one block = length × breadth = 0,5 m × 0,5 m ✓SF = 0,25 m^2 Area of 12 blocks = 0,25 m^2 × 12 ✓MA = 3 m^2 ✓CA **OR/*OF***	**CA from Question 3.1.2** 1SF substituting correct values 1MA multiply by 12 1CA answer in m^2 **OR/*OF*** 1SF substituting correct values 1MA multiply by 12 1CA answer in m^2 **OR/*OF***	M L2

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T&L
	Area of 12 blocks = 12 × (side × side) *Area van 12 blokke* = 12 × (0,5 m × 0,5 m) ✓SF = 12 × 0,25 m^2 ✓MA = 3 m^2 ✓CA **OR/*OF*** Area of 12 blocks = 12 × (side × side) *Area van 12 blokke* = 12 × (50 cm × 50 cm) ✓SF = 12 × 2 500 cm^2 ✓MA = 3 m^2 ✓CA	1SF substituting correct values 1MA multiply by 12 1CA answer in m^2 **OR/*OF*** 1SF substituting correct values 1MA multiply by 12 1CA answer in m^2 (3)	
3.2.2	Area of walkway ✓SF 4,05 m × 1,45 m = 5,8725 m^2 ✓A Area to be covered with pebbles = 5,8725 m^2 – 3 m^2 ✓MCA = 2,8725 m^2 ✓CA **OR/*OF*** Area to be covered with pebbles ✓SF (4,05 m × 1,45 m) – 3 m^2 ✓A = 5,8725 m^2 – 3 m^2 ✓MCA = 2,8725 m^2 ✓CA **OR/*OF*** Area of walkway ✓SF 405 cm × 145 cm = 58 725 cm^2 ✓A Area to be covered with pebbles = 58 725 cm^2 – 30 000 cm^2 ✓MCA = 28 725 cm^2 ✓CA **OR/*OF***	**CA from Question 3.2.1** 1SF substitution 1A simplification 1MCA subtracting area of blocks 1CA simplification **OR/*OF*** 1SF substitution 1A simplification 1MCA subtracting area of blocks 1CA simplification **OR/*OF*** 1SF substitution 1A simplification 1MCA subtracting area of blocks 1CA simplification **OR/*OF***	M L3

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T&L
3.2.2	Area to be covered with pebbles ✓SF (405 cm × 145 cm) – 30 000 cm^2 ✓A = 58 725 cm^2 – 30 000 cm^2 ✓MCA = 28 725 cm^2 ✓CA	1SF substitution 1A simplification 1MCA subtracting area of blocks 1CA simplification **NPR** (4)	
3.2.3	$\frac{5{,}7\ \text{m}^2}{0{,}36\ \text{m}^2}$ ✓MA = 15,833 ✓CA = 16 bags of pebbles/*sakkies klippies* ✓RCA	1MA dividing by 0,36 m^2 1CA simplification 1RCA rounding (3)	M L2
3.3.1	Length of large window frame/*Lengte van die groot vensterraam* $\frac{890\,\text{mm}}{10}$ ✓MA = 89 cm ✓CA	1MA dividing by 10 1CA simplification **AO** (2)	M L1
3.3.2	Perimeter/*Omtrek* ✓MA = 18,5 cm + 18,5 cm + 18,5 cm + 18,5 cm = 74 cm ✓CA **OR/*OF*** Perimeter/*Omtrek* = 4 × 18,5 cm ✓MA = 74 cm ✓CA ***AFRIKAANS ONLY OMIT SUB QUESTION 3.3.2 – UPSCALE FROM 24 TO 26***	1MA adding 4 sides 1CA simplification **OR/*OF*** 1MA side multiplied by four 1CA simplification (2)	M L1
3.3.3	Diameter/*Deursnee* = 1,85 cm × 2 = 3,7 cm ✓A $\frac{18{,}5\,\text{cm}}{3{,}7\,\text{cm}}$ ✓M = 5 beads ✓CA	1A diameter 1M dividing by diameter 1CA simplification (3)	M L2

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T&L
3.3.4	✓MA $2 \times 18{,}5 \text{ cm} = \frac{3}{4}$ of the width of the large window/*van die wydte van die grooter venster* ✓A $37 \text{ cm} = \frac{3}{4}$ of the width of the large window/*van die wydte van die grooter venster* Width of large window/*breedte van groot venster* $=37 \text{ cm} \times \frac{4}{3}$ ✓MA $= 49{,}33 \text{ cm}$ ✓CA	1MA multiply 18,5 by 2 1A simplification 1MA multiply with inverse 1CA simplification **NPR** (4)	M L2
		[26]	

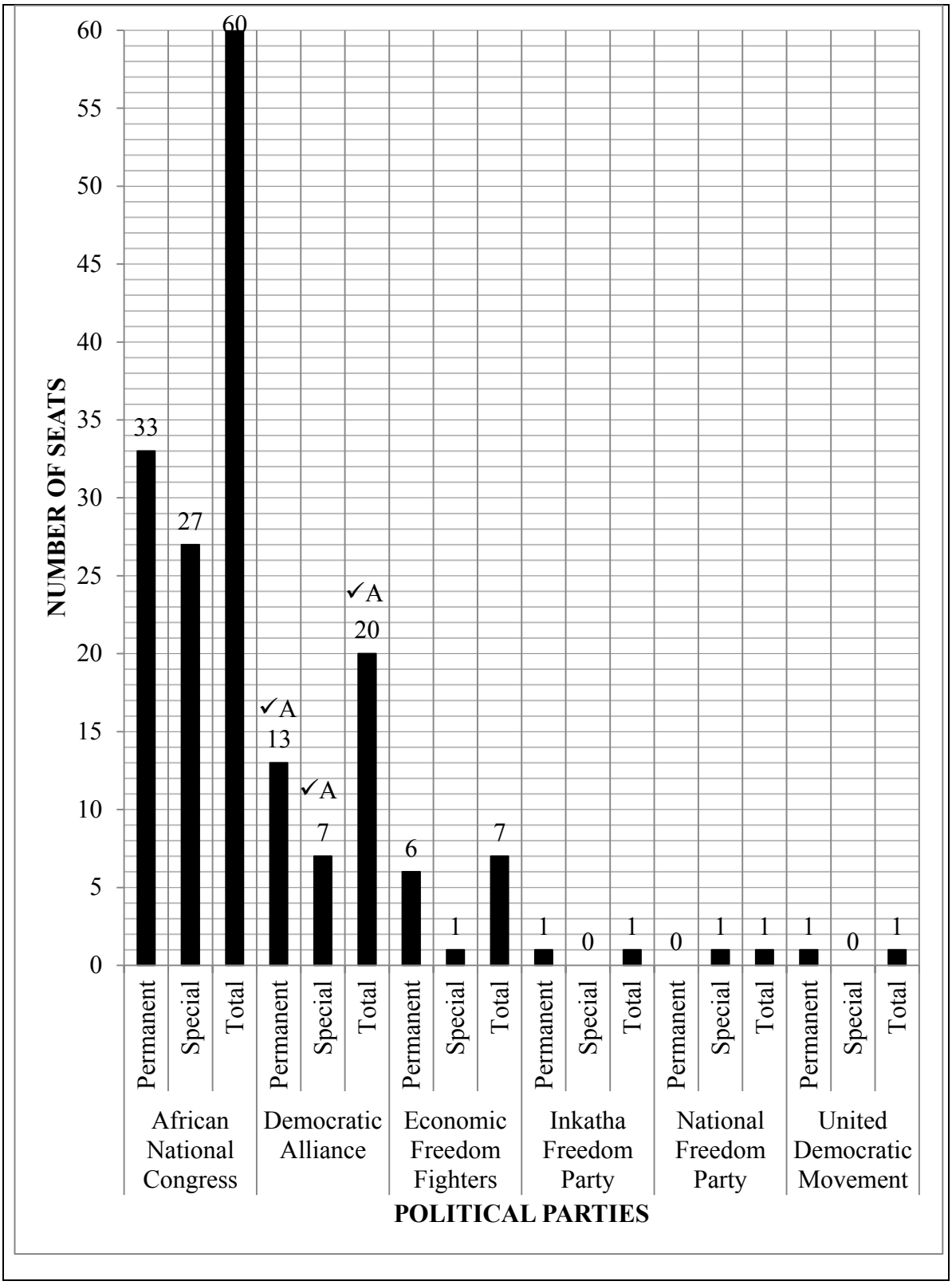
QUESTION/*VRAAG* 4 [24 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T&L**
4.1.1	Camping, swimming, dining(eating) and checking-in (enquiries/registration/making payments). *Kampeer, swem en eet en inboek (navrae/registrasie/betalings maak).* ✓✓✓✓ A	4A 4 correct activities (4)	MP L1
4.1.2	Umngeni ✓✓ RT	2RT reading from map (2)	MP L1
4.1.3	5 restaurants / *restaurante* ✓✓ RT	2RT reading from map (2)	MP L1
4.1.4	Bar Scale/Staafskaal ✓✓A	2A correct scale Accept: Line scale/*Lynskaal/ Balkskaal* (2)	MP L1
4.1.5	✓A 4,2 cm = 4 km 1 cm = 0,9524 km ✓M ✓MA ∴10 cm = 9,524 km ≈ 10 km ✓CA **OR/*OF*** $\frac{10\text{ cm}}{4{,}2\text{ cm}} \times 4\text{ km}$ ✓M ✓MA ✓A = 9,524 km ≈ 10 km ✓CA **OR/*OF*** ✓A 2,1 cm = 2 km 1 cm = 0,9524 km ✓M ✓MA ∴10 cm = 9,524 km ≈ 10 km ✓CA **OR/*OF***	1A measure bar scale 1M concept of scale 1MA multiply by scale 1CA conversion **OR/*OF*** 1A measure bar scale 1M concept of scale 1MA multiply by scale 1CA conversion **OR/*OF*** 1A measure bar scale 1M concept of scale 1MA multiply by scale 1CA conversion **OR/*OF***	MP L2

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T&L
4.1.5	$\frac{10\text{ cm}}{2{,}1\text{ cm}} \times 2\text{ km}$ ✓M ✓MA ✓A = 9,524 km ≈ 10 km ✓CA	1A measure bar scale 1M concept of scale 1MA multiply by scale 1CA conversion Accept 4,1 cm – 4,3 cm Accept 2 cm – 2,1 cm (4)	
4.1.6	Total distance/*Totale afstand* = 10 km × 2 = 20 km ✓MA Time/*tyd* = $\frac{20\text{ km}}{30\text{ km/h}}$ ✓SF Time/*tyd* = 0,6666666667 hours ✓C × 60 = 40 minutes/*minute* ✓CA **OR/*OF*** Time/*tyd* = $\frac{10\text{ km}}{30\text{ km/h}}$ ✓SF = 0,3333 ∴ In minutes/*minute* = 0,3333 ✓C × 60 = 20 minutes/*minute* ✓MA ∴ Total time/*Totale tyd* = 20 ×2 = 40 minutes/*minute* ✓CA	 1MA total distance (20 km) 1SF correct substitution 1C conversion 1CA simplification **OR/*OF*** 1SF correct substitution 1C conversion 1MA simplification 1CA simplification (4)	MP L2
4.2.1	2 ✓✓A	2A number of doors Accept 3 (2)	MP L2

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T&L
4.2.2	✓RT ✓RT Bedroom 1, Bathroom and Bedroom 2 / *Slaapkamer 1, Badkamer en Slaapkamer 2* **OR/*OF*** ***ONLY AFRIKAANS CANDIDATES:*** ✓RT ✓RT *Slaapkamer 1, Kombuis*	1RT first room 1RT other 2 rooms **OR/*OF*** 1RT bedroom 1 1RT kitchen (2)	MP L2
4.2.3	$\frac{0}{2}$ **OR/*OF*** 0 **OR/*OF*** 0% **OR/*OF*** Impossible/*Onmoontlik* ✓✓A	2A probability (2)	P L2
		[24]	

QUESTION/*VRAAG* 5 [28 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T&L**
5.1.1	Questionnaires **OR** Interviews **OR** Survey **OR** Document analysis **OR** Research **OR** Observation *Vraelys **OF** Onderhoud **OF** Meningspeiling (opname) **OF** Dokument analise **OF** Navorsing **OF** Observeer* ✓✓A	2A means of collecting data (2)	D L1
5.1.2	**% Yard trimmings/*Werfsnoeisels*** ✓MA = 100% − (3,4% + 11,2% + 49,7% + 3,3% +9,0%) = 100% − 76,6%✓M = 23,4% ✓CA	1MA adding all correct values 1M subtracting from 100% 1CA simplification **AO** (3)	D L2
5.1.3	**% Textiles/*Tekstiele*** = 11,2% − (1,6% + 2,3% + 2,9% + 1,7%) = 11,2% − 8,5%✓MA = 2,7% ✓CA	1MA subtracting from 11,2% 1CA simplification **AO** (2)	D L2
5.1.4	Tons of plastic/*Ton plastiek* ✓RT $91\,160\,000 \times \frac{3,4}{100}$ ✓MA = 3 099 440 tons/*ton* ✓CA **OR/*OF*** ✓RT $91,16 \times \frac{3,4}{100}$ ✓MA = 3,09944 million tons/*ton* ✓CA	1RT correct total 1MA multiply by 3,4% 1CA simplification **OR/*OF*** 1RT correct total 1MA multiply by 3,4% 1CA simplification **NPR** (3)	D L2
5.1.5	Cans, pieces of a motor vehicles, household appliances; scrap metal **OR** any other product that includes metal / *Blikke, dele van 'n motorfiets, afvalmetaal **OF** enige ander produk wat metaal bevat.* ✓✓A	2A metal products that are recyclable (2)	D L1

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T&L
5.1.6	Stacked bar graph **OR** Compound bar graph **OR** Bar graph *Saamgestelde staaf grafiek **OF** Stapel/balk grafiek **OF** Staaf grafiek* ✓✓A	2A type of graph (2)	D L1
5.1.7	Probability/*Waarskynlikheid* Other/*Ander* = 11,2% ✓RT ✓MA 1,7% + 1,6% + 2,3% + 2,9% = 8,5% $\frac{8,5}{11,2}$ ✓M = 0,7589285 ✓CA **OR/*OF*** ✓A ✓RT $1 - \frac{2,7}{11,2}$ ✓MA = 0,7589285 ✓CA	1RT correct values 1MA adding all values 1M dividing 1CA simplification **OR/*OF*** **CA from Question 5.1.3** 1RT correct values 1A for the number one 1MA subtracting 1CA simplification **NPR** (4)	P L2
5.2.1	10 ✓✓A	2A correct number (2)	D L1
5.2.2	Number of seats/*setels* ✓A 33 : 27 ✓M = 11 : 9 ✓CA	1A correct values 1M ratio in correct order 1CA simplified ratio Accept unit ratio or fractional form (3)	D L1
5.2.3	National Freedom Party / NFP *Nasionale Vryheidsparty/NVP/NFP* ✓✓RT	2RT reading from table (2)	D L1

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T&L
5.2.4			D L2
	3A bars correctly drawn		(3)
			[28]
		TOTAL/*TOTAAL*: 150	

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basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P2

ADDENDUM

NOVEMBER 2019

This addendum consists of 6 pages with 5 annexures.

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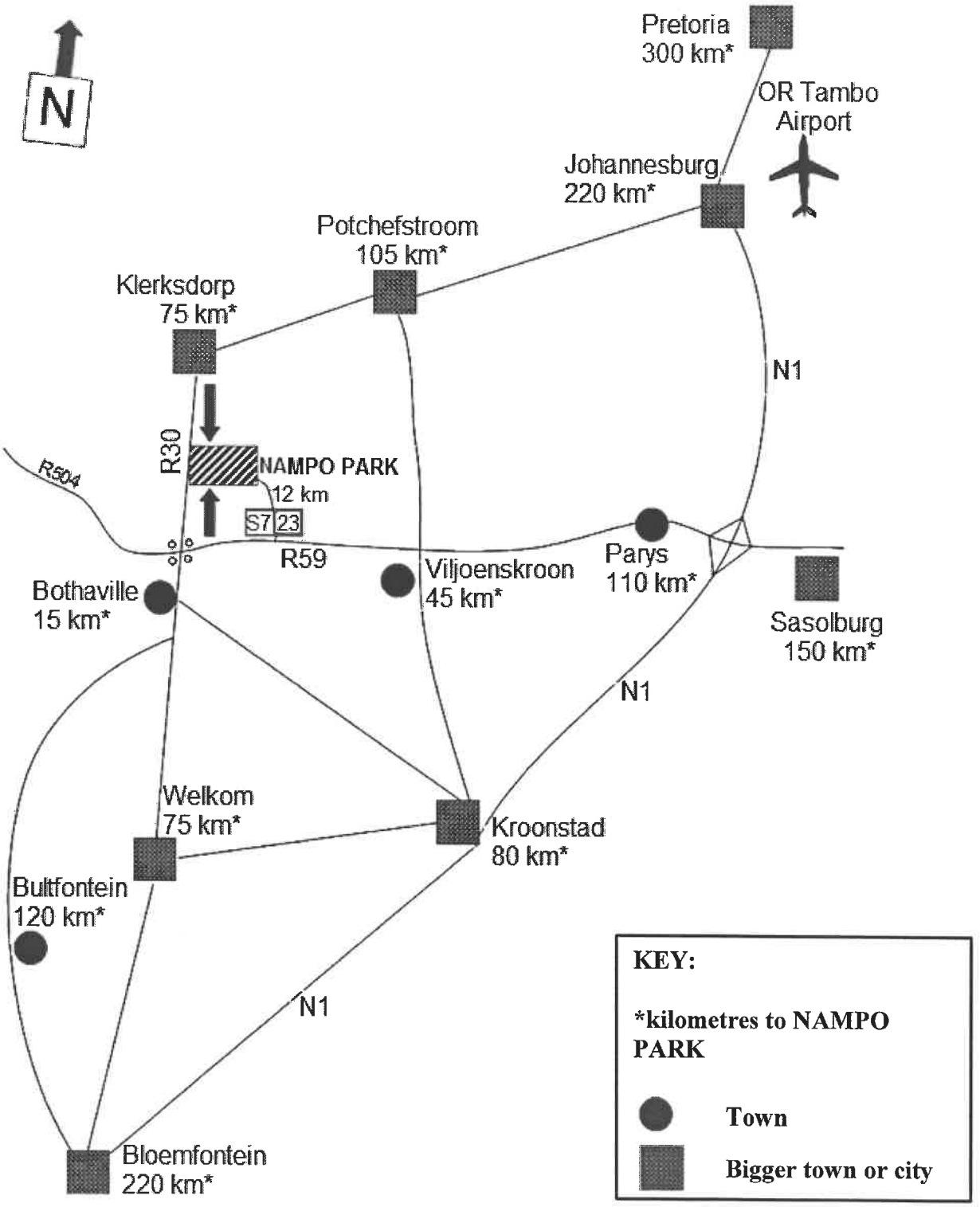
ANNEXURE A

QUESTION 1.1

ROUTE MAP TO NAMPO PARK

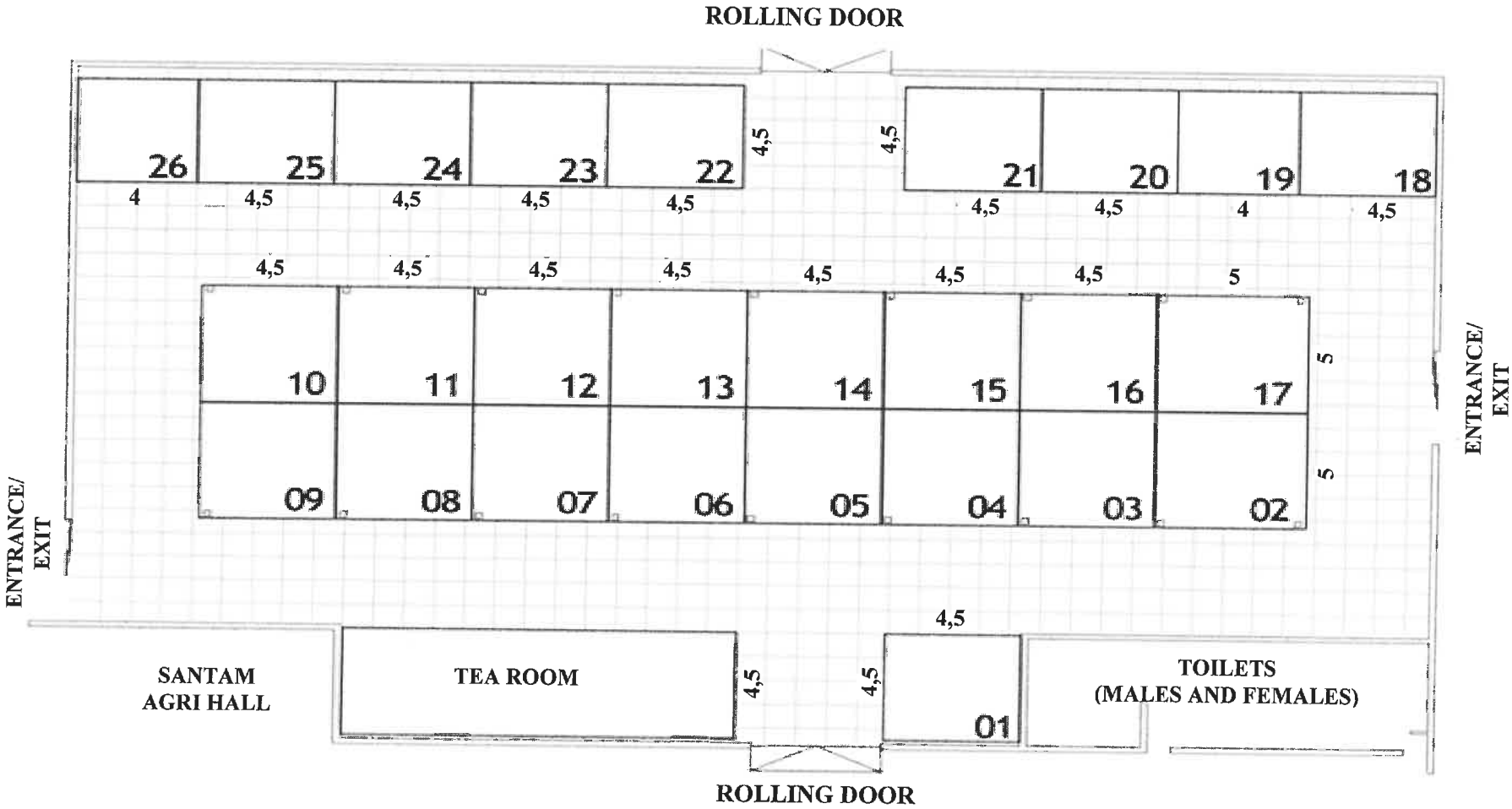


[Adapted from grainsa.co.za]

ANNEXURE B

QUESTION 1.3

FLOOR PLAN OF AN EXHIBITION HALL AT NAMPO PARK



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ANNEXURE C

QUESTION 2.2

TAX RATES FOR INDIVIDUALS

2018/2019 TAX YEAR (1 MARCH 2018–28 FEBRUARY 2019)

TAXABLE INCOME	RATES OF TAX
0–195 850	18% of taxable income
195 851–305 850	35 253 + 26% of taxable income above 95 850
305 851–423 300	63 853 + 31% of taxable income above 305 850
423 301–555 600	100 263 + 36% of taxable income above 423 300
555 601–708 310	147 891 + 39% of taxable income above 555 600
708 311– 1 500 000	207 448 + 41% of taxable income above 708 310
1 500 001 and above	532 041 + 45% of taxable income above 1 500 000

TAX REBATE	2019
Primary	R14 067
Secondary (65 and older)	R7 713
Tertiary (75 and older)	R2 574

MEDICAL SCHEME TAX REBATES PER MONTH (R)	2019
For the tax payer who paid medical scheme contributions	R310
For the first dependant	R310
For each additional dependant	R209

[Source: sars.gov.za]

ANNEXURE D

QUESTION 2.4

TABLE 1: TOP MARGINAL TAX RATES FOR INDIVIDUALS IN THE G20 COUNTRIES

	UNIT %	
COUNTRY	**2019**	**PREVIOUS**
Japan	55,95	55,95
Netherlands	52,00	52
Germany	47,50	47,5
Australia	45,00	45
China	45,00	45
France	45,00	45
South Africa	45,00	45
Spain	45,00	45
United Kingdom	45,00	45
Italy	43,00	43
South Korea	40,00	40
Switzerland	40,00	40
United States of America	37,00	39,6
India	35,88	35,54
Argentina	35,00	35
Mexico	35,00	35
Turkey	35,00	35
Canada	33,00	33
Indonesia	30,00	30
Brazil	27,50	27,5
Singapore	22,00	22
Russia	13,00	13
Saudi Arabia	0,00	0

[Source: //tradingeconomics.com/country-list]

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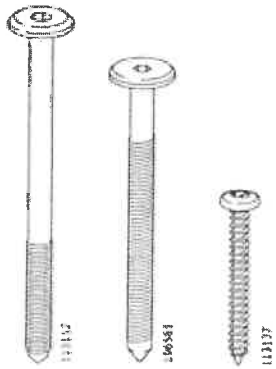
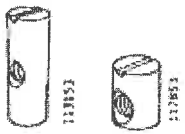
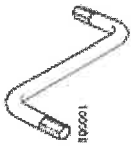
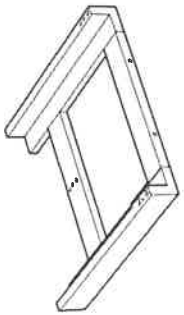
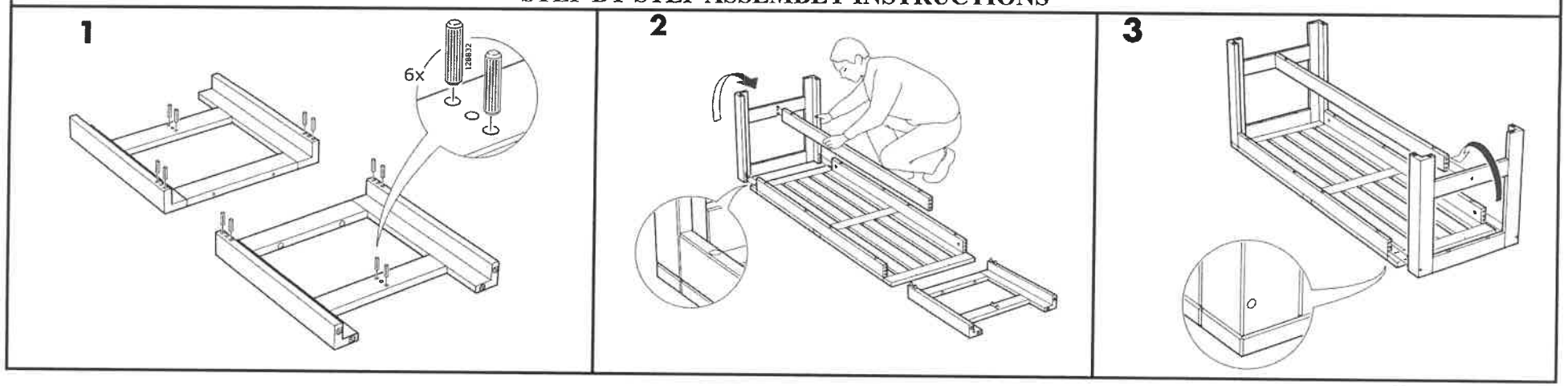
ANNEXURE E

QUESTION 3.5

LIST OF PARTS

SCREW			DOWEL	DOWEL NUT SLEEVE		ALLEN KEY	BENCH LEG	LONG PANEL	BENCH SEAT
									
4x	2x	4x	12x	2x	4x	1x	2x	1x	1x

STEP BY STEP ASSEMBLY INSTRUCTIONS



[Source: ikea.com]

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INSTRUCTIONS AND INFORMATION

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

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

   ANNEXURE A for QUESTION 1.1
   ANNEXURE B for QUESTION 1.3
   ANNEXURE C for QUESTION 2.2
   ANNEXURE D for QUESTION 2.4
   ANNEXURE E for QUESTION 3.5

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. Indicate units of measurement, where applicable.

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

10. Write neatly and legibly.

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QUESTION 1

1.1 An annual agricultural show is held at NAMPO Park in the Free State in May. Farmers and other interested people visit this show to see the latest developments in farming.

ANNEXURE A shows the route map to NAMPO Park.

Use ANNEXURE A to answer the questions that follow.

1.1.1 Name the TWO towns closest to NAMPO Park. (2)

1.1.2 Give the TWO general compass directions that a visitor must use to travel by car from OR Tambo Airport, via Klerksdorp, to reach NAMPO Park. (4)

1.1.3 The distance from Bloemfontein to Welkom is 152 km and the distance from Bloemfontein to Bultfontein is 100 km.

Determine, with calculations, the route the organisers used to indicate the distance from Bloemfontein to NAMPO Park. (3)

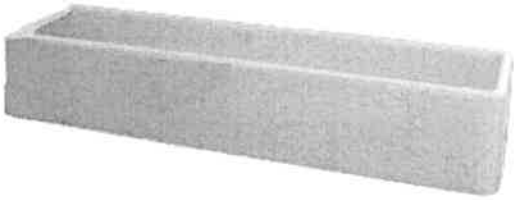
1.1.4 Alfred departs from NAMPO Park at 18:45 and travels to Sasolburg at an average speed of 88 km/h. He calls his wife to inform her that he will arrive in Sasolburg at 8 pm.

Verify, with calculations, whether his timing is correct.

You may use the formula:

Distance = speed × time (6)

1.2 There are rectangular prism-shaped water troughs for cattle on display. The troughs are made of concrete, as shown in the picture below.

PICTURE OF A CONCRETE TROUGH	OUTER DIMENSIONS OF A TROUGH
	Length = 3 m Width = 685 mm Height = 40 cm

Volume of a rectangular prism = length × width × height

NOTE:
- A trough is a long, narrow, open container for animals to drink from.
- 1 ℓ = 1 000 cm^3

Use the information above to answer the questions that follow.

1.2.1 Calculate, in cm^3, the volume of concrete used to make this trough if the trough can hold a maximum of 485 ℓ of water. (7)

1.2.2 A cow drinks 56 ℓ of water per day. Alfred stated that a full trough has enough water for 8 cows per day.

Verify, with calculations, whether this statement is CORRECT. (3)

1.2.3 Determine how long, to the nearest minute, it will take to fill a half empty trough if the water flows in at a rate of 14,5 ℓ per minute. (3)

1.3 ANNEXURE B shows the floor plan of one of the exhibition halls at NAMPO Park, with distances given in metres.

Use ANNEXURE B to answer the questions that follow.

1.3.1 Determine the approximate distance from stand 14 to the nearest rolling door. (2)

1.3.2 Measure the distance from the beginning of stand 10 to the end of stand 17 and hence, determine, to ONE decimal place, the scale of this plan. (4)

1.3.3 The exhibitor's rate for a 4 m × 4 m stand is R22 942.

Cyril stated that he must pay exactly R25 000 for stand 26.

Verify, showing ALL calculations, whether this statement is valid. (5)
[39]

QUESTION 2

2.1

According to the SARS data for December 2017, South Africa's 148 266 millionaires earn between R1 million and R2 million per annum.

The number of millionaires increased by 5,0065% compared to the previous year. The total annual taxable income for ALL the millionaires was R287,24 billion.

[Source: *SARS Statistics*, released December 2017]

Use the information above to answer the questions that follow.

2.1.1 It was stated that the mean monthly income per millionaire is exactly R161 000.

Verify, with calculations, whether this statement is CORRECT. (5)

2.1.2 Calculate the number of millionaires in South Africa in the previous year (2016). (3)

2.2

ANNEXURE C shows the tax rates for individuals for the 2018/2019 tax year. John (68 years old) received a taxable income of R2 045 364 for the 2018/2019 tax year. He paid a monthly contribution towards a medical scheme for himself and his wife.

Use the information above and ANNEXURE C to answer the questions that follow.

2.2.1 Calculate John's total medical scheme tax rebate for the year. (3)

2.2.2 Hence, calculate the amount of income tax he had to pay for the 2018/2019 tax year. (8)

2.3

John's daughter, Megan, works in Denmark. She earns an annual gross salary of Kr600 000 (Kr is the unit for Danish kroner.) She informed her father that she had the following annual deductions from her salary:

- Kr229 760 for investment policy
- Kr48 000 for labour market contribution
- Kr37 200 for employment deduction

Use the information above to answer the questions that follow.

2.3.1 Calculate, in rand, Megan's annual gross salary using the following exchange rates:

1 euro = 15,64 South African rands
1 euro = 7,47 Danish kroner

(4)

2.3.2 John stated that Megan's total annual deductions (excluding tax) are more than 52% of her annual gross salary.

Verify, showing ALL calculations, whether this statement is valid. (4)

2.4 TABLE 1 on ANNEXURE D shows the top marginal tax rate for individuals in the G20 countries. This table provides present and past data of the top marginal tax rates. It was updated in January 2019.

Use the information in ANNEXURE D to answer the questions that follow.

2.4.1 Name the country that has the biggest range between 2019 and the past top marginal tax rates. (2)

2.4.2 Determine, to THREE decimal places, the probability of randomly selecting one of the G20 countries where the latest tax rates changed from the previous tax rate. (3)

2.4.3 Use the 2019 top marginal tax rate and answer the following questions:

(a) Determine quartile 2 (2)

(b) The interquartile range is given as 12.

Verify, showing ALL calculations, whether the given interquartile range is CORRECT. (4)
[38]

QUESTION 3

3.1 Franco is training to become a pilot. The following shows the approximate cost to get a private pilot's licence:

- 28 hours' flying with an instructor @ R2 050 per hour
- 18 hours' solo flying at a total cost of R31 050
- 15 hours' theory lessons costing R1 242 per 3-hour lesson
- 2-hour ground evaluation test costing R700
- Flying-kit including notes costing R6 544
- 7 examinations @ R190 per examination

NOTE: Solo flying means to fly the airplane on your own.

[Adapted from businesstech.co.za]

3.1.1 Calculate, in rand per minute, the rate for solo flying. (3)

3.1.2 Calculate the total approximate cost to get a private pilot's licence. (5)

3.2 Two years ago Franco had invested R90 000 at an interest rate of 8,5% per annum compounded yearly.

Verify, with calculations, whether this total amount with interest is enough to pay for a private pilot's licence. (6)

3.3 Franco noted that not all the students passed the examinations.

TABLE 2 and TABLE 3 show information regarding the same group of students that sat for the examinations. All students that failed, attempted the examinations again.

3.3.1 TABLE 2 below shows information regarding the percentage of students that passed or failed the examinations.

TABLE 2: PASS OR FAIL RATE PER ATTEMPT

	1ST ATTEMPT	2ND ATTEMPT
Failure rate	80%	70%
Pass rate	20%	30%

Give a possible reason why the probability of passing increased after the first attempt. (2)

3.3.2 TABLE 3 below shows the actual numbers of students listed in TABLE 2 that sat for the examinations. Some values have been omitted.

TABLE 3: TOTAL NUMBER OF STUDENTS AND RESULTS

	FAIL	PASS	TOTAL
1st attempt	**A**	24	**B**
2nd attempt	67	**D**	**C**

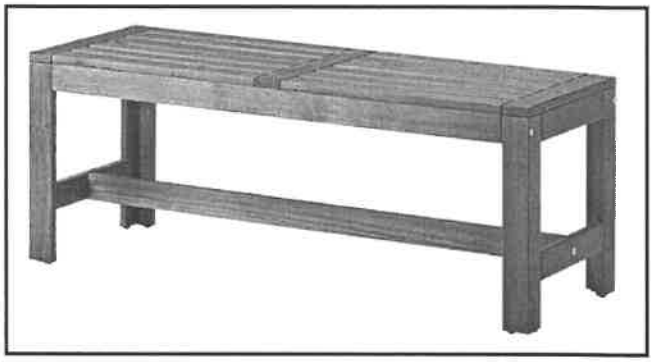
Determine, showing ALL calculations, the missing values **A**, **B**, **C** and **D** to calculate the total number of students that passed after both attempts. (6)

3.4 Franco's flying instructor has completed 26 000 hours of flying. It was stated that these hours can be converted to 154 weeks, 5 days and 8 hours of flying.

Verify, showing ALL calculations, whether this statement is valid. (5)

3.5 Franco assembles benches for their flying field. The benches are sold as loose parts contained in a box, ready to be assembled.

PICTURE OF AN ASSEMBLED BENCH



ANNEXURE E has the list of parts and the first THREE assembly illustrations.

Use ANNEXURE E to answer the questions that follow.

3.5.1 Write down the total number of loose parts in a box. (2)

3.5.2 Write down TWO instructions that will match the illustration in step 2. (4)

3.5.3 Explain the purpose of the long panel. (2)
[35]

QUESTION 4

4.1 The Republic of South Africa (RSA) conducts household censuses to collect information. The next census will take place in 2021.

Census information regarding household size is shown below.

HOUSEHOLD SIZE

HOUSEHOLD SIZE	CENSUS 1996	CENSUS 2001	CENSUS 2011
One	16%	19%	27%
Two	17%	18%	19%
Three	15%	15%	15%
Four	15%	15%	14%
Five or more	36%	33%	25%
Total number of households	**8,7 million**	**10,8 million**	**14,5 million**

[Source: statssa.gov.za]

NOTE:

- A census is an official count or survey.
- According to Stats SA, a household consists of a single person or a group of people who live together for at least four nights a week, who eat together and who share resources.

Use the data above to answer the questions that follow.

4.1.1 Determine the percentage increase in the total number of households from 2001 to 2011. (3)

4.1.2 State which household size matches EACH of the following trends:

(a) Increased every year, but only by a small percentage (2)

(b) Remained constant in every census from 1996 to 2011 (2)

4.1.3 It was stated that the percentage of households with five or more persons decreased from 2001 to 2011, therefore the number of households with five or more persons **decreased** by 0,060 million.

Verify, showing ALL calculations, whether this statement is CORRECT. (5)

4.1.4 Explain why the percentages for the 1996 census do not add up to 100%. (2)

4.1.5 Write down the probability of randomly choosing a household from the 2011 census with a household size fewer than four persons. (3)

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4.2 The information below shows the per capita income of households in South Africa in 2011.

HOUSEHOLDS IN SOUTH AFRICA		
INCOME PER CAPITA PER DAY		**NUMBER OF HOUSEHOLDS**
R280 and more		11% 1,4 million
R80 to R279		24% 3,1 million
R20 to R79		41% 5,4 million
Less than R20		24% 3,2 million

[Source: Household survey 2011]

NOTE: Children under 10 years of age count as half a person for per capita calculations.

4.2.1 Write down the modal class for the income per capita per day. (2)

4.2.2 Determine the total number of households with a per capita income of less than R80 per day. (2)

4.2.3 The Wong Family has the following income per person:

- Mr Wong: R276 000 per year
- Mrs Wong: R541 500 per year

Calculate the Wong household income per capita per day if they have 2 children, aged 15 and 8 years old.

You may use the formula:

$$\textbf{Per capita income} = \frac{\textbf{Total income per household}}{\textbf{Household size}}$$ (6)

4.2.4 A household with an income of R280 per capita per day spends 4% of their income on cellphones.

Determine the total amount spent by this household on cellphones per year. (3)

4.3 TABLE 4 below shows the number of households that have access to amenities (services) in their houses. Some of the data have been omitted.

TABLE 4: NUMBER OF HOUSEHOLD WITH ACCESS TO AMENITIES FOR SELECTED YEARS

	2001	2007	2011	2016
Flush toilets	5,8 million 53%	7,2 million 58%	8,7 million 60%	10,7 million ...
Tap water	6,9 million 62%	8,7 million 69%	10,6 million 73%	14,3 million 84,5%
Electricity	7,8 million 70%	10,0 million 80%	12,2 million 85%	14,8 million ...
Total households		**H**	14 450 161	16 923 309

[Source: Census 2001, 2011 and Community survey 2007 and 2016]

Use the information in the table above to answer the questions that follow.

4.3.1 To determine **H** in the table, two learners provided the following calculations:

IAN	NEO
$H = \frac{10{,}0\text{ million}}{80} \times 100$ $= 12{,}5\text{ million}$	$H = \frac{10{,}0\text{ million}}{100} \times 80$ $= 8\text{ million}$

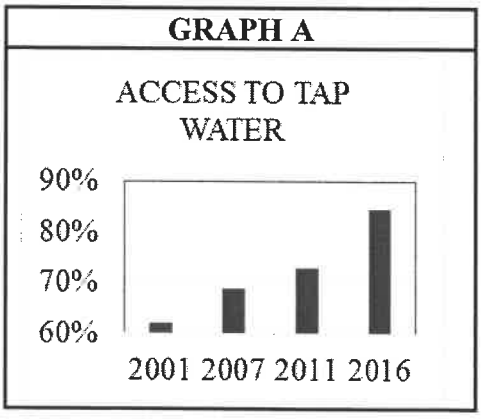
Give the name of the person whose answer was INCORRECT. (2)

4.3.2 The average expenditure on electricity per household was R125 per month and for tap water R98 per month.

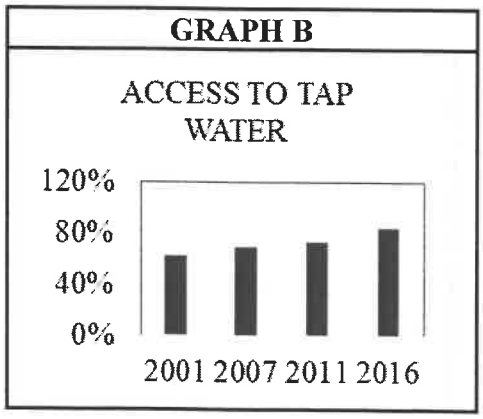
Calculate, in millions, the total that was spent by all the households on electricity and tap water in 2011. (4)

4.3.3 The graphs below show the same data for the number of households that have access to tap water.

GRAPH A



GRAPH B



Give ONE reason for the difference in the length of the bars for each of the graphs. (2)

[38]

TOTAL: 150

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