education

Department:
Education
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

SUBJECT: MATHEMATICAL LITERACY
NQF LEVEL 2
PAPER 1

NOVEMBER 2007

(******)

(X-Paper)
09:00 – 12:00

EXEMPLAR QUESTION PAPER

This question paper consists of 11 pages.

DEPARTMENT OF EDUCATION
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)
MATHEMATICAL LITERACY: NQF LEVEL 2
TIME: 3 HOURS
MARKS: 150

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions:

1. This question paper consists of NINE questions. Answer ALL the questions.
2. Clearly show ALL calculations, diagrams, graphs, etc you have used in determining the answers.
3. An approved calculator may be used, unless stated otherwise.
4. Drawing instruments including rulers, pairs of compasses and protractors may be used.
5. Number the answers CORRECTLY according to the numbering system used in this question paper.
6. Diagrams are not necessarily drawn to scale.
7. Write neatly and legibly.

SECTION A

QUESTION 1

1.1 Calculate the following (you need only write down the answer)

1.1.1 $450 + 350 \times 65$ (1)

1.1.2 $(25{,}8 - 5{,}2) \div 0{,}4$ (1)

1.1.3 $\frac{1}{2} + \frac{3}{4} - \frac{1}{4}$ (1)

1.1.4 $4 \times \frac{1}{3} + 4 \times \frac{2}{3}$ (1)

1.1.5 $250 \times 3 + 125 \times 5 - 265 \times 2$ (1)

1.2 441 of the 980 students at the college voted in the elections. Express this amount as a percentage (2)

1.3 A store offers 15% discount for cash. How much will you pay for an item that costs R145,00 if you pay cash? (2)

1.4 You currently earn R85,00 per day. How much will you earn, per day, after a 6% increase (2)

1.5 Cold drink is prepared by mixing concentrate and water in the ratio 1 : 3. How much water must be added to $\frac{1}{2}$ a cup of concentrate? (2)

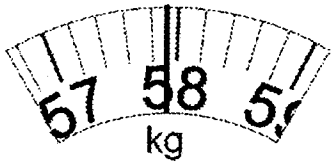
1.6 Mushrooms are sold at R24,50 per kilogram. How much must you pay for 1,400kg of mushrooms? (2)

1.7 An egg carton can hold 6 eggs. How many cartons can be completely filled with 262 eggs? (2)

1.8 A soccer squad of 22 players must be accommodated in a hotel that has 3 beds per room. What is the least number of rooms that must be booked? (2)

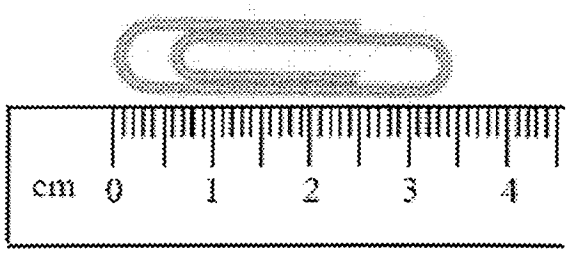
1.9 R240,00 must be shared between Leanne and Vuyo in the ratio 2 : 3. How much will each person get? (2)

1.10 What is the mass (weight) shown on the bathroom scale alongside? Give your answer as accurately as possible.



(2)

1.11 What is the length of the paperclip in the diagram alongside (in terms of the ruler provided)? Give your answer as accurately as possible.



(2)
[25]

QUESTION 2

2.1 Refer to the till slip below to answer the questions that follow

STAR
JACKSONS STAR
TEL 023-534-0202
VAT NO. 4930198765

CHICKEN MAYO SAN	R7.99
F/CRM MILK 500ML	R3.99 *
JUNGL ENERGY BAR	R3.99
WINE GUM ROLLS 2×R1.98	R3.96
GRAPES WHITE	R12.99 *
CARRIER BAG 12L	R0.20
POWERADE NAARTJIE	R5.46
8 BALANCE DUE	R38.58
Rounding	R0.03 -
Cash	R40.00

TAX-CODE	TAXABLE-VAL	TAX-VALUE
VAT	R21.60	R2.65
Zero VAT	R16.98	R0.00
TOTAL TAX		R2.65

CHANGE	R1.45

CASHIER NAME: Natasha
C0005 #9703 10:35:17 15JAN2007

2.1.1 On what date and at what time did this transaction take place? (2)

2.1.2 How does the till slip indicate items that are zero rated with respect to VAT? (1)

2.1.3 What is the unit cost, expressed in R/ℓ, of: F/CRM MILK? (2)

2.1.4 What does the "8" on the left of "BALANCE DUE" refer to? (1)

2.1.5 How much does the client actually pay for their groceries? Justify your answer in two different ways (3)

2.1.6 What is the significance of the "-" symbol on the right of the "Rounding" entry? (1)

2.2 Refer to the ATM statement below to answer the questions that follow

```
ATM 12345 KLERKSDORP

2007-01-18 11H25

CASH WITHDRAWAL

FROM ACCOUNT 123 567 283

AMOUNT:              R500,00

STATEMENT
15/01   R100,00 -   CASH
15/01     R5,05 -   FEE
16/01   R356,51 -   ACB
16/01     R6,65 -   FEE
17/01 R1 762,20     CR
18/01   R500,00 -   CASH

AVAILABLE            R935,67
LATEST               R955,67
```

2.2.1 On what date and at what time was this receipt issued? (2)

2.2.2 What does the "-" after the amounts on 15/01; 16/01 and 18/01 indicate? (1)

2.2.3 The abbreviation ACB is used to indicate an electronic funds transfer (e.g. a stop order). How much was the transaction fee associated with the ACB on 16/01? (1)

2.2.4 What does the "CR" after the amounts on 17/01 indicate? (1)

2.2.5 Give one possible reason for the difference between the "AVAILABLE" and "LATEST" amounts. (1)

2.2.6 What was the account balance at the end of the day on 17/01? (3)

[19]

QUESTION 3

3.1 Refer to the tariff table for camp sites below and answer the questions that follow:

Camp site without Power Point at Punda Maria Restcamp - Kruger National Park, South Africa					
Season	Price per Unit per night	Occupants at Unit Price	Per Extra Adult per night	Per Extra Child per night	Max Number of Persons
2006-11-01 to 2007-10-31	R100,00	1 – 2	R40,00	R20,00	6
2007-11-01 to 2008-10-31	R110,00	1 – 2	R40,00	R20,00	6

3.1.1 What is the maximum number of people that may stay on a campsite? (1)

3.1.2 What is the cost per night if exactly 2 people stay on the camp site in June 2007? (2)

3.1.3 What is the cost per night if 3 adults and 2 children stay on the camp site in June 2007? (3)

3.1.4 From what date does the per unit price increase? (1)

3.1.5 What is the cost per night if six adults stay on the camp site in June 2008? (3)

3.2 The Post Office calculates the volumetric mass of a parcel to determine the postage cost. The formula used is: volumetric weight $= \frac{\text{length} \times \text{breadth} \times \text{height}}{5000}$ kg where length, breadth and height are given in cm.

Determine the volumetric weight of a parcel with dimensions:
length = 45cm, breadth = 35cm and height = 25cm. (3)
[13]

QUESTION 4

4.1 Refer to the distance (km) table for major South African towns below and answer the questions that follow:

Bloemfontein											
1004	Cape Town										
634	1753	Durban									
586	1099	679	East London								
869	438	1317	638	George							
398	1402	630	1002	1285	Johannesburg						
177	962	811	780	824	472	Kimberley					
932	629	1254	575	63	1351	887	Knysna				
743	506	1377	575	60	1170	698	123	Oudtshoorn			
968	665	1218	538	99	1387	923	36	159	Plettenberg Bay		
677	769	1003	324	314	1099	1138	251	374	215	Port Elizabeth	
456	1460	636	1040	1229	58	530	1417	1199	1348	1133	Pretoria
570	1314	445	234	872	862	747	809	932	773	558	920	Umtata

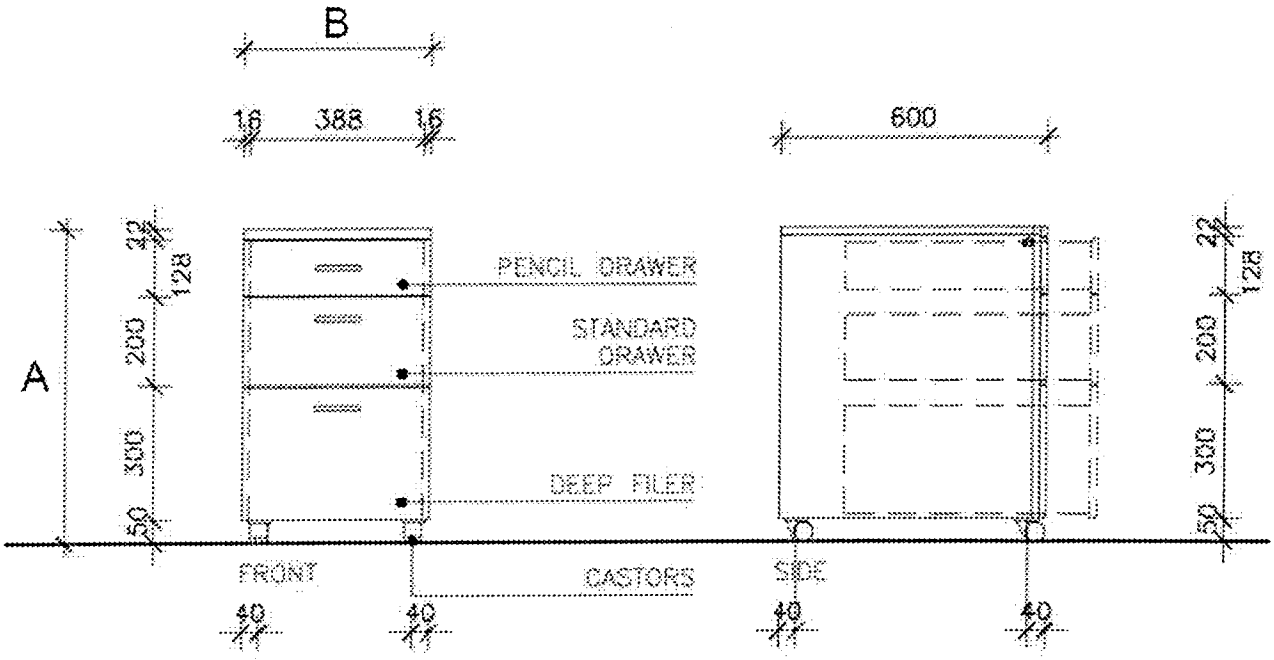
4.1.1 What is the distance between Bloemfontein and Cape Town? (1)

4.1.2 What is the distance between Durban and Plettenberg Bay? (1)

4.1.3 Name two towns that are 324km from each other? (1)

4.1.4 How far is the journey: Durban – Johannesburg – Kimberley – Durban? (4)

4.2 Refer to the drawing of a filing cabinet below (all dimensions in mm) and answer the questions that follow:



4.2.1 How many drawers does the filing cabinet have? (1)

4.2.2 What is the value of the missing dimension A? (2)

4.2.3 What is the value of the missing dimension B? (2)

4.2.4 What is the surface area of the top of the filing cabinet? (4)

[16]

QUESTION 5

5.1 Refer to the log table for Group 10 of the African cup of nations (Afcon) qualification tournament (correct at 15 March 2007) and answer the questions that follow

Team	P	W	D	L	Pts
Lesotho	3	1	0	2	3
Niger	3	0	1	2	1
Nigeria	3	3	0	0	9
Uganda	3	1	1	1	4

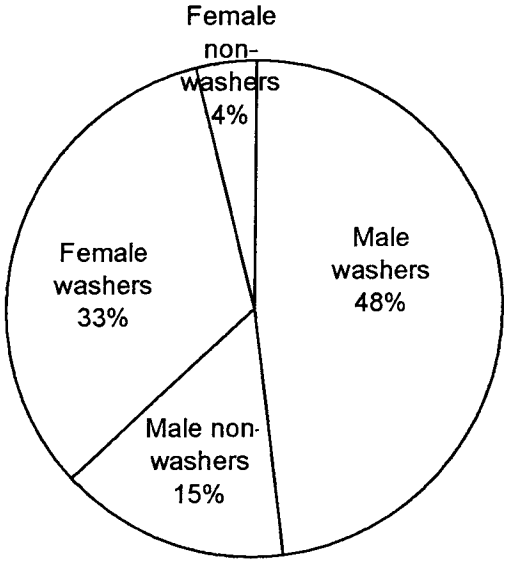
Key:
P: Matches played
W: Matches won
D: Matches drawn
L: Matches lost
Pts: Points: (3 for a win;1 for a loss; 0 for a loss)

5.1 How many games have Niger won, lost and drawn? (3)

5.2 Determine the team's positions in the group from 1st to 4th at this stage. (3)

5.3 Which two teams played each other and drew? (1)

5.2 In a survey 6336 people were observed using public bathrooms in the United States. The graph below shows the percentage of males and females observed who did and did not wash their hands after using the toilet



5.2.1 What percentage of the people observed were men who did not wash their hands? (1)

5.2.2 Calculate how many of the men who were observed washed their hands? (3)

5.2.3 Calculate how many of the men who were observed did not wash their hands? (3)

5.2.4 Calculate what percentage of the men who were observed washed their hands (3)

[17]

SECTION B

QUESTION 6

6.1 The Telkom tariff structure for domestic calls is detailed in the table below.

Domestic telephone call charges	Minimum charge rand (VAT incl.)	Rand per second (VAT incl.)	Minimum charge rand (VAT incl.)	Rand per second (VAT incl.)
	Standard Time: Mon to Fri 07:00 to 19:00		Callmore time: Mon to Fri 19:00 to 07:00 and Fri 19:00 to Mon 07:00	
Local (0-50km)	0,594	0,00634	0,594	0,00257
Long distance (>50km)	0,722	0,01203	0,722	0,00601

According to the table calls are charged per second and are subject to a minimum charge.
Answer the questions that follow based on this information in the table

6.1.1 What is the per-second charge for a long distance call during Standard time? (1)

6.1.2 What is the minimum charge for a long distance call during Standard time? (1)

6.1.3 After how many seconds does a long distance call during Standard time cost more than the minimum charge? (give your answer in minutes and seconds) (4)

6.1.4 After how many seconds does a local call during Callmore time cost more than the minimum charge? (give your answer in minutes and seconds) (4)

6.1.5 What is the length of a local call made during Standard Time that costs R2,00? (5)

[15]

QUESTION 7

7.1 A herbal medicine dosage pamphlet gives the following rule for determining a child's dosage in terms of the adult dosage

Young's rule: Divide the child's age by the child's age plus 12. Example: dosage for a 4 year old: 4 divided by (4+12) = $\frac{1}{4}$ or 0,25 of the adult dosage.

Answer the question that follow using this formula

7.1.1 What fraction of an adult dosage must a 12 year old take? (4)

7.1.2 If the adult dosage of a certain medicine is 60 drops, how many drops should an eight year old child be given? (5)

7.1.3 A mother gives her child 4 drops of a certain medicine. The adult dosage is 20 drops. How old is the child? (6)

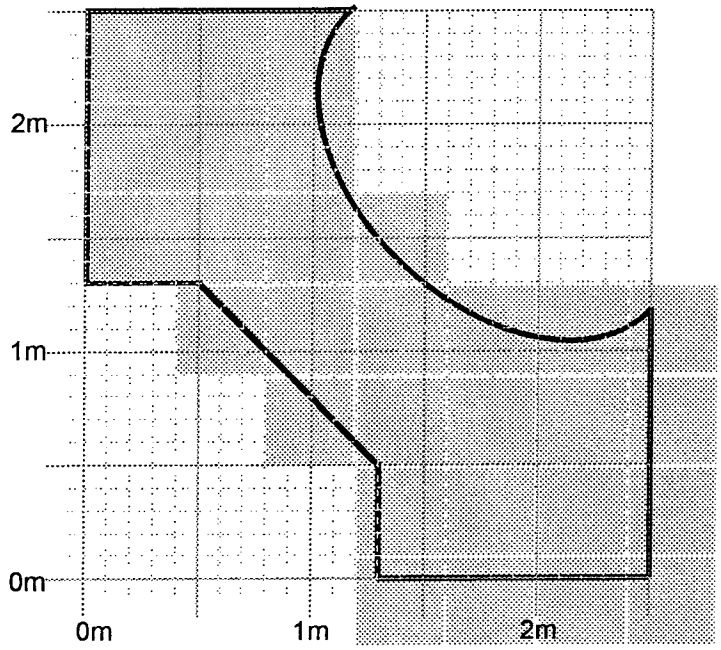
[15]

QUESTION 8

8.1 The sketch below shows the outline of a bathroom floor that needs to be tiled.

Peter, who is going to tile the floor has drawn the floor tiles (400mm × 400m) onto the plan.

Answer the questions that follow based on the diagram.



8.1.1 How many tiles will Peter need to tile the floor? (3)

8.1.2 If 25% of the tiles that need to be cut typically break, how many extra tiles should be bought? (4)

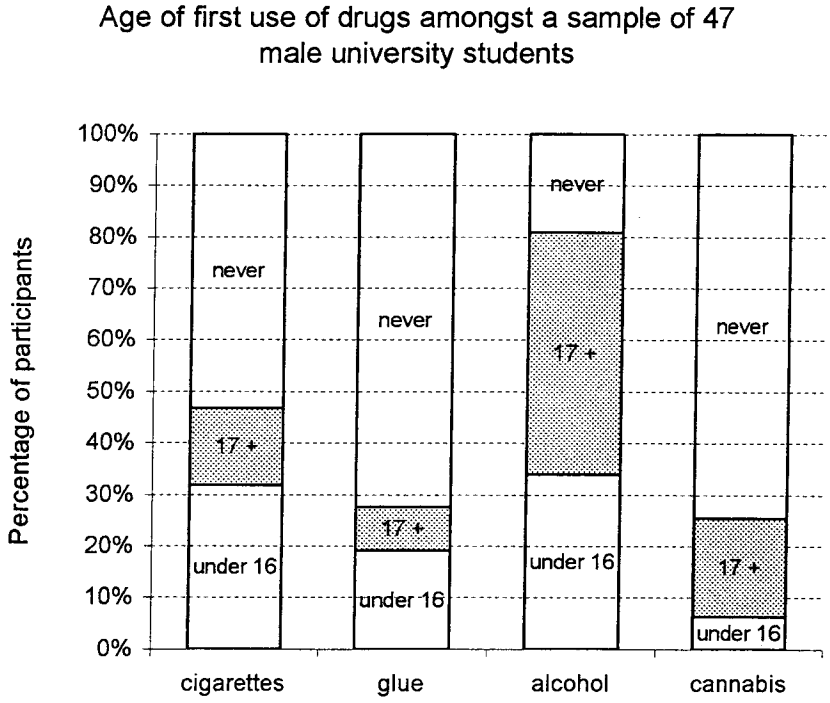
8.1.3 The tiles are sold in boxes of 8 tiles. How many boxes should be bought? (3)

8.1.4 If Peter charges R150,00 per square meter to lay the tiles, how much will he charge for this job? (5)

[15]

QUESTION 9

9.1 47 male university students participated in a survey where they were asked at what age they started using different substances



9.1.1 Which substance was used by most of the males before 16 years of age? (2)

9.1.2 Which substance was used by the fewest men? (2)

9.1.3 Calculate how many men claim to have used cigarettes before turning 16? (3)

9.1.4 Calculate how many men claim to have started used glue when they were older than 16? (3)

9.1.5 Compare the trend in first using glue and cannabis? (5)

[15]

education

Department:
Education
REPUBLIC OF SOUTH AFRICA

MEMORANDUM

NATIONAL CERTIFICATE (VOCATIONAL)

EXEMPLAR 2007

SUBJECT: MATHEMATICAL LITERACY
NQF LEVEL 2
PAPER 1

EXEMPLAR 2007

MARKING CODES

A	:	mark for accuracy
CA	:	mark for consistent accuracy
M	:	mark for correct method
S	:	mark for correct statement
R	:	mark for correct reason
S/R	:	mark for correct statement with correct reason

This memorandum consists of 8 pages.

Question 1

Number	Solution	Comment	Marks
1.1			
1.1.1	$450 + 350 \times 65 = 23\,200$		1
1.1.2	$(25{,}8 - 5{,}2) \div 0{,}4 = 51{,}5$		1
1.1.3	$\frac{1}{2} + \frac{3}{4} - \frac{1}{4} = 1$		1
1.1.4	$4 \times \frac{1}{3} + 4 \times \frac{2}{3} = 4$		1
1.1.5	$250 \times 3 + 125 \times 5 - 265 \times 2 = 845$		1
1.2	$\frac{441}{980} = 45\,\%$	0,45 – 1 mark only	2
1.3	R145,00 – 15% of R145,00 = R145,00 - R21,75 = R123.25	1 mark for R21,75 1 mark for solution -1 mark no units	2
1.4	R85,00 + 6% of R85,00 = R85,00 + R5,10 = R90.10	1 mark for R5,10 1 mark for solution -1 mark no units	2
1.5	concentrate : water = 1 : 3 $= \frac{1}{2} : 1\frac{1}{2}$ or $\frac{1}{2} : \frac{3}{2}$ i.e. $1\frac{1}{2}$ cups of water	1 mark for working 1 mark for solution OR 2 marks for solution only -1 mark no units	2
1.6	1,4kg × R24,50 per kg = R34,30	1 mark for working 1 mark for solution OR 2 marks for solution only -1 mark no units	2
1.7	262 eggs ÷ 6 eggs/carton = 43,7 cartons ∴43 cartons can be filled	1 mark for 43,7 1 mark for solution OR 2 marks for solution only -1 mark no units	2
1.8	22 players ÷ 3 players per room = 7,33 rooms ∴8 rooms are needed	1 mark for 7,33 1 mark for solution OR 2 marks for solution only -1 mark no units	2

Number	Solution	Comment	Marks
1.9	Leanne : Vuyo = 2 : 3 $\Rightarrow$ Leanne gets $\frac{2}{5} \times 240{,}00 = R96{,}00$ $\Rightarrow$Vuyo gets R240,00 – R96,00 = R144,00 OR $\Rightarrow$Vuyo gets $\frac{3}{5}$ x 240,00 = R144,00	1 mark for recognising that the whole must be divided into 5 parts 1 mark for solution OR 2 marks for solution only -1 mark no units	2
1.10	Accept any mass (weight) greater than 57,8kg and less than 58kg	-1 mark no units	2
1.11	3,4cm Accept any length greater than 3,55cm and less than 3.45cm	-1 mark no units	2

Question 2

Number	Solution	Comment	Marks
2.1			
2.1.1	Date: 15 January 2007 Time: 10:35	1 mark date 1 mark time	2
2.1.2	The symbol: * is placed after items that are zero rated		1
2.1.3	500 ml = R3.99 $\therefore$ 1 *l* = R7.98 per *l*	-1 mark no units	2
2.1.4	8 refer to the number of items that have been purchased		1
2.1.5	R38.45 Method 1: Groceries actual cost = R38,58 Rounding -R 0,03 R38,45 Method 2 : Cash = R40,00 Change -R 1,45 R38,45	1 mark for solution 1 mark for each method OR -1 mark no units	1
2.1.6	" – " indicates a credit to the account OR " – " indicates an amount that is being deducted	1 mark for answer that indicates understanding	1
2.2.1	Date : 18 January 2007 Time :11:25	1 mark date 1 mark time	2

Number	Solution	Comment	Marks
2.2.2	" – " indicates a debit to the account OR " – " indicates an amount that is being deducted		1
2.2.3	Transaction fee = R6,65		1
2.2.4	" CR " indicates a credit to the account		1
2.2.5	The bank expects clients to maintain a minimum balance in their account (in this case R20)	1 mark answer that indicates understanding	1
2.2.6	Balance at end of 17/01 is determined by working backwards from the latest balance at the end of the statement: Closing balance (17/01) = R955,67 + R500,00 = R1455,67	1 mark approach that indicates understanding 1 mark correct values 1 mark correct answer OR 3 marks for solution only -1 mark no units	3

Question 3

Number	Solution		Comment	Marks
3.1				
3.1.1	6 people/persons		-1 mark no units	1
3.1.2	R100		-1 mark no units	1
3.1.3	2 occupants at unit price 1 extra adult 2 extra children R20,00 Cost per night	R100,00 R40,00 R40,00 R180,00	2 marks working 1 mark solution OR 3 marks for solution only -1 mark no units	3
3.1.4	01 November 2007			
3.1.5	2 occupants at unit price 4 extra adulst @ R40,00 Cost per night	R110,00 R160,00 R270,00	2 marks working 1 mark solution OR 3 marks for solution only -1 mark no units	3
3.2	Volumetric weight $= \frac{\text{length} \times \text{breadth} \times \text{height}}{5000}$ $= \frac{45\text{cm} \times 35\text{cm} \times 25\text{cm}}{5000}$ $= 7{,}9\text{ kg} \approx 8\text{ kg}$		2 marks formula and substitution 1 mark solution OR 3 marks for solution only -1 mark no units	3

Question 4

Number	Solution	Comment	Marks
4.1			
4.1.1	Bloemfontein – Cape Town: 1 004km		1
4.1.2	Durban – Plettenberg Bay: 1 218km		1
4.1.3	East London and Port Elizabeth		1
4.1.4	Durban to Johannesburg : 630km Johannesburg to Kimberley : 472km Kimberley to Durban : 811km Total distance: 1 913 km	1 mark for each correct distance 1 mark total OR 4 marks for solution only -1 mark no units	4
4.2			
4.2.1	3 drawers		1
4.2.2	Length of A: =(50 + 300 + 200 + 128 + 22)mm =700mm		2
4.2.3	Length of B: = (16 + 388 + 16)mm =420mm		2
4.2.3	Surface area of top: = length × breadth = 420mm × 600mm = 252 000mm^2	1 mark formula 2 marks substitution 1 mark solution OR 4 marks for solution only -1 mark no units	4

Question 5

Number	Solution	Comment	Marks
5.1			
5.1.1	Niger: Won = 0 games Lost = 2 games Draw = 1 game	1 mark for each correct answer	
5.1.2	1. Nigeria 2. Uganda 3. Lesotho 4. Niger	1 mark for each of the top three teams in the correct position -1 4th position not listed	4
5.1.4	Niger and Uganda		1
5.2			

Number	Solution	Comment	Marks
5.2.1	Men that did not wash hands = 15% of all the people		1
5.2.2	Men that washed hands 48% of 6336 people observed = 3041men	1 mark correct percentage 1 mark method 1 mark answer OR 3 marks for solution only	3
5.2.3	Men that did not wash hands: 15% of 6336 people observed = 950men	1 mark correct percentage 1 mark method 1 mark answer OR 3 marks for solution only	3
5.2.4	Total men observed: 3041 + 950 = 3991 ∴ percentage of men that washed their hands $= \frac{3041}{3991} = 76{,}2\%$ OR 76%	1 mark total 2 marks answer (76% OR 2 marks for 0,762 OR 3 marks for solution only	3

Section B

Question 6

Number	Solution	Comment	Marks
6.1			
6.1.1	per-second rate for long distance call during Standard time = R0,01203 per second	-1 mark no units	1
6.1.2	minimum charge for long distance call during Standard time = R0,722	-1 mark no units	1
6.1.3	minimum charge ÷ per-second rate = R0,722 ÷ R0,01203 per second = 60,01 ≈ 60 seconds OR 1 minute	1 mark method 2 mark substitution 1 mark correct answer OR 5 marks for solution only -1 mark no units	4
6.1.4	minimum charge ÷ per-second rate = R0,594 ÷ R0,00257 per second = 231 seconds OR 3 minutes and 51 seconds	1 mark method 2 mark substitution 1 mark correct answer OR 5 marks for solution only -1 mark no units	4

Number	Solution	Comment	Marks
6.1.5	R2,00 > minimum charge $\therefore$ duration = cost ÷ rate = R2,00 ÷ R0,00634 per second = 315,46 seconds ≈ 5 minutes and 16 seconds	2 mark method 2 mark substitution 1 mark correct answer OR 5 marks for solution only -1 mark no units	5

Question 7

Number	Solution	Comment	Marks
7.1			
7.1.1	Dosage (for 12 year old) = 12 ÷(12 + 12) $= \frac{1}{2}$ of adult dosage	1 mark method 2 mark substitution 1 mark correct answer OR 4 marks for solution only -1 mark no units	4
7.1.2	Dosage (for 8 year old) = 8 ÷(8 + 12) $= \frac{8}{20}$ of adult dosage OR $\frac{2}{5}$ Actual dosage $= \frac{2}{5}$ of 60 drops = 24 drops	1 mark method 2 marks fraction of adult dosage 2 marks actual dosage OR 5 marks for solution only -1 mark no units	5
7.1.3	$\frac{4ml}{20ml} = \frac{1}{5}$ of adult dosage $\Rightarrow \frac{age}{age + 12} = \frac{1}{5}$ $\therefore$ age of child = 3 years	2 marks fraction of adult dosage 1 mark method 3 marks age (any method) OR 6 marks for solution only -1 mark no units	6

Question 8

Number	Solution	Comment	Marks
8.1			
8.1.1	29 tiles (determined by counting)		3
8.1.2	Must buy 29 plus 25% of 29 tiles = 29 + 25% × 29 = 29 + 7,25 (round up to 8) = 37 tiles	1 mark method 2 mark calculation 1 mark correct answer OR 4 marks for solution only -1 mark no units	4

Number	Solution	Comment	Marks
8.1.3	37 tiles ÷ 8 tiles per box (= 4,625) = 5 boxes	1 mark method 1 mark calculation 1 mark rounding up OR 3 marks for solution only -1 mark no units	3
8.1.4	Area to be tiled ≈ 29 tiles × (0,4 × 0,4)m^2 per tile ≈ 4,64m^2 Cost = 4,64m^2 × R150/m^2 = R696,00 Accept any well argued method that results in a cost of between R550,00 and R700,00	2 mark method area 1 mark calculation area 1 mark method cost 1 mark calculation cost OR 2 marks for solution only -1 mark no units	5

Question 9

Number	Solution	Comment	Marks
9.1			
9.1.1	alcohol		2
9.1.2	cannabis		2
9.1.3	32% of 47 accept (± 2%) of 32% ≈ 15 men	1 mark 32% (± 2%) 2 mark solution -1 no unit	3
9.1.4	37% - 28% = 9% of men accept (± 2%) of 37% and 28% 9% of 47 ≈ 4 men	2 mark 9% (± 2%) 2 mark solution -1 no unit	4
9.1.5	More men started using glue before they turned 16 than men started using cannabis, However, more men started using cannabis later in life and fewer picked up the glue habit ⇒ glue seems to be the substance of choice among the younger men and cannabis among the older men – this may be related to the cost of the products	1 mark for a statement OR 2 marks for a substantiated but incomplete statement OR 4 marks for a well argued case	4