higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICAL LITERACY
(Second Paper)
NQF LEVEL 3

(10401023)

5 November 2018 (X-Paper)
09:00–12:00

This question paper consists of 10 pages and 2 answer sheets.

TIME: 3 HOURS
MARKS: 150

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. Read All the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Start EACH question on a NEW page.
5. Show ALL the calculations clearly.
6. Round off your answers correctly according to the given context. In all other cases, where the context is not specific, round off your answers correctly to two decimal places.
7. Indicate units of measurement, where applicable.
8. Diagrams are not necessarily drawn to scale.
9. Write neatly and legibly.
10. Answer QUESTION 1.2 on ANSWER SHEET A and QUESTION 2.2.2 on ANSWER SHEET B. Write your examination number in the spaces provided on the ANSWER SHEETS and hand them in with your ANSWER BOOK.

QUESTION 1

1.1 Easy Breezy is a company that sells cleaning products. A customer purchased cleaning products and received the following invoice. The missing values on the invoice are numbered according to the questions that need to be answered.

Easy Breezy			
Item description	Number of items	Cost per item (VAT inclusive)	Total cost
Super clean car shampoo (5ℓ)	**1.1.1**	R39,95	R319,60
Shiny car wax (1 kg)	6	R60,52	**1.1.2**
Polish cloths	**1.1.3**	10 cloths cost R15	R75
Clean wheel brush	10	R48	R480
		VAT (15%)	**1.1.4**
		Total price VAT inclusive	R1 237,72

Study the invoice and answer the following questions:

1.1.1 How many 5 ℓ containers of car shampoo did the customer buy? (2)

1.1.2 Calculate the total cost of the six Shiny car wax 1 kg packs. (2)

1.1.3 How many polish cloths did the customer buy? (3)

1.1.4 The cost per item is VAT inclusive. VAT is charged at 15%, Calculate the VAT amount. (4)

1.2 The financial officer of Easy Breezy wants to make sure that the company pays the correct amount for water consumption. Complete the water tariff table found on ANSWER SHEET A (attached) to prove that 26 kℓ of water consumed costs R255,63. (5)

1.3 The Annual Income and Expenditure Statement of Easy Breezy is shown in the table below. The missing values on the statement are numbered according to the questions that need to be answered.

Annual Income and Expenditure Statement **Amount in Rand**		Easy Breezy
Income:		
Net sales		653 000
Expenses:		
Cost of goods sold	83 000	
Selling expenses	142 000	
General and administrative	93 000	
Total Expenses		**(1.3.1)**
Income before tax		335 000
Provisional tax at 12%		**(1.3.2)**
Net income		**(1.3.3)**

Study the statement and answer the following questions:

1.3.1 Calculate the total expenses. (2)

1.3.2 If provisional tax is 12% of the income before tax, calculate the amount paid towards provisional tax. (3)

1.3.3 Calculate the net income. (3)

1.4 Mr Thomas is the manager of a Baywash. His pay slip is displayed below. The missing values on the pay slip are numbered according to the questions that need to be answered.

Salary advice: Uzile Thomas Banking details: Money Bank Account number: 111 259 777 Date: 30/12/2017	BAYWASH
Income:	**Deductions:**
Basic salary: R8 200	UIF: **1.4.1**
Bonus: **1.4.2**	Medical Aid: R1 300
Overtime: **1.4.3**	Pension: R1 400
Total income: 1.4.4	**Total deductions: A**
	Net salary: B

Study the pay slip and answer the questions.

1.4.1 UIF is calculated on 1% of the basic salary.

Calculate the amount deducted for UIF. (2)

1.4.2 Determine Mr Thomas' bonus if it is half of his basic salary. (2)

1.4.3 Mr Thomas worked 50 hours of overtime during the month. Overtime is calculated as follows:

- 30 hours overtime at 1,5 times his normal salary rate
- 20 hours overtime at double his normal salary rate
- Normal salary rate is R45 per hour.

Calculate the total amount Mr Thomas earned for overtime. (5)

1.4.4 Calculate Mr Thomas' total income. (2)

1.4.5 Determine whether Mr Thomas' net salary (take home salary) is less than R13 000? Justify your answer by calculating the values of A and B. (5)

[40]

QUESTION 2

2.1 Mr Thomas pays casual workers an amount of R50 per day as well as R15 per car washed.

2.1.1 A casual worker washed five cars on a weekday.

How much did she earn on that day? (2)

2.1.2 Write a formula that Mr Thomas can use to calculate the total daily wage of each casual worker.

Total wage = … (3)

2.1.3 Use the formula in QUESTION 2.1.2 to determine the number of cars a casual worker washed if he earned a wage of R425 on a specific day? (4)

2.2 Mr Thomas employs casual workers to work in shifts. The table below shows the number of shifts to be worked by the number of casual employees.

Number of casuals	2	3	4	6	9	18
Number of shifts	18	12	9	6	4	2

2.2.1 Is the relationship displayed in the above table a direct relationship or an inverse relationship? Give a reason for your answer. (3)

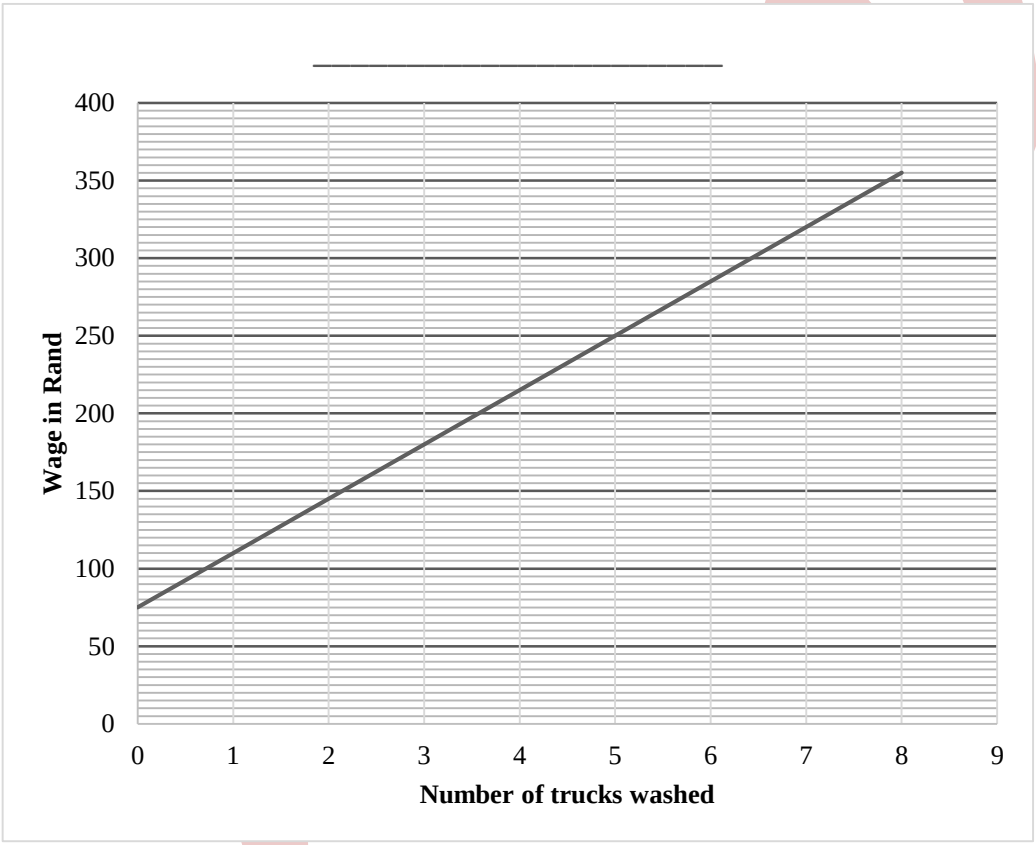
2.2.2 Use the above table to draw a line graph on the grid found on the ANSWER SHEET B (attached). Label the horizontal and vertical axes and provide a suitable heading for the graph. (10)

2.3 The table below shows the income for buses washed. Use the table to answer the question.

Number of buses	1	2	3	**B**
Income in Rand	**A**	320	480	1 920

Calculate the value of A and B. (4)

2.4 The daily wage of the casual worker who washes the trucks is represented in the following graph. Study the graph before answering the questions.



2.4.1 Provide a suitable heading for the graph. (1)

2.4.2 Name the independent variable from the table. (1)

2.4.3 How much does the casual worker receive as a daily basic wage before any truck is washed? (2)

2.4.4 A casual worker earned R215 on his first day of work.

How many trucks did he wash on that day? (2)

2.4.5 Calculate the amount the casual worker receives per truck he washes. (3)

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QUESTION 3

3.1 Mr Thomas conducted a survey to observe the different types of cars that came for a wash on a Saturday morning. The table below represents the findings:

TYPE OF CAR	NUMBER OF CARS WASHED
Toyota	12
Volkswagen	8
Ford	15
BMW	5

3.1.1 How many cars were washed altogether? (2)

3.1.2 What is the probability of a casual worker washing a Toyota? Give your answer in simplest fraction form. (3)

3.1.3 Determine the probability of a casual worker not washing a BMW. Give your answer as a percentage. (3)

3.2 Mr Thomas also kept a record of the number of BMWs and Fords that were washed over 10 consecutive days. The table below represents the data he recorded:

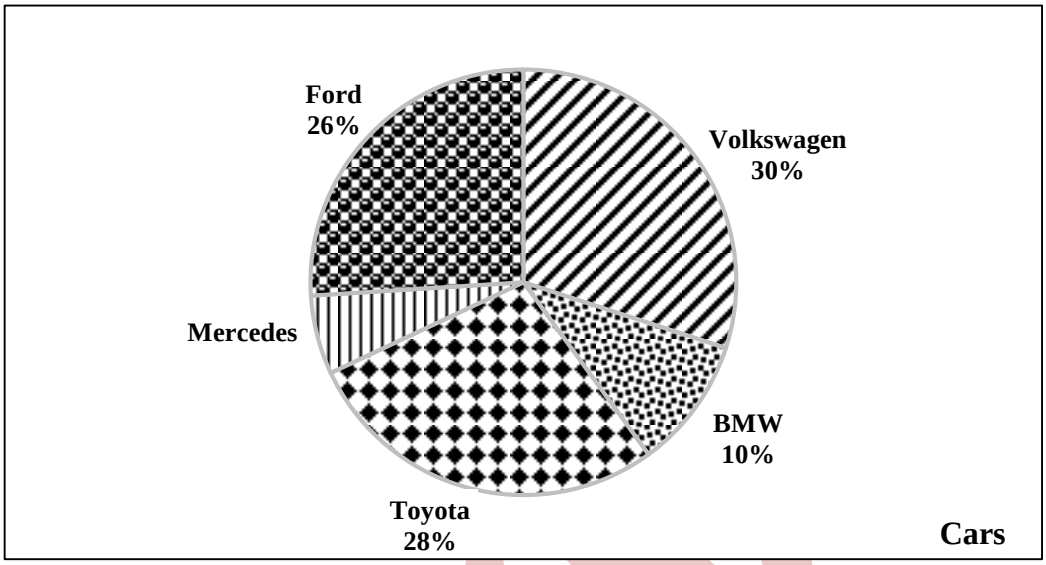
Day	1	2	3	4	5	6	7	8	9	10
Number of BMWs	15	4	8	15	20	2	5	6	10	15
Number of Fords	5	7	2	8	12	4	6	9	11	14

3.2.1 On which day were the most number of BMWs and Fords, washed altogether? Give the day and the total number of vehicles that were washed on that day. (2)

3.2.2 Determine the difference between the median of BMWs and the median of Fords that were washed over the ten days. (6)

3.2.3 Determine the difference between the mean (average) of BMWs and the mean of Fords that were washed over the ten days. (6)

3.3 The pie chart below represents the percentage of the different cars that were washed in a month. A total of 650 cars had been washed altogether.



Study the above pie chart to answer the questions.

3.3.1 Calculate the number of Mercedes that were washed during that month. (5)

3.3.2 Determine the percentage median of the different cars washed during that month. (2)

3.3.3 Calculate the actual number of cars of the car that represents the percentage median. (3)

3.3.4 Give two reasons why the pie chart title is not appropriate and provide a suitable title for the pie chart. (3)

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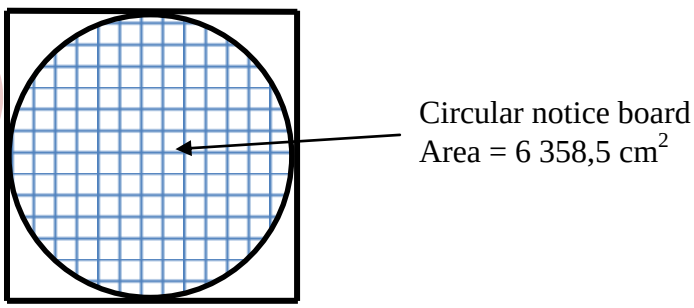
QUESTION 4

4.1 The car wash has a circular notice board, which has an area of 6 358,5 cm^2, with a square frame around it.

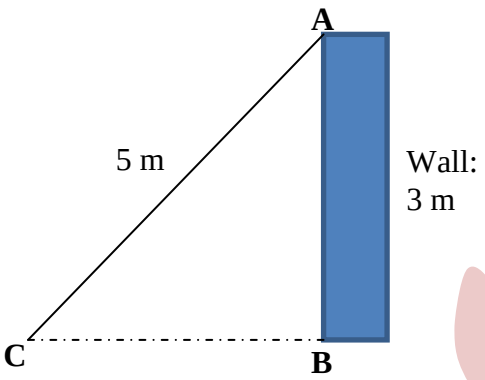


4.1.1 Determine the diameter of the circular notice board.

Hint: $r = \sqrt{\frac{area}{\pi}}$ and $\pi = 3,14$ (5)

4.1.2 Calculate the perimeter of the square frame. Give your answer in metres. (3)

4.2 The notice board is mounted on a 3 metre wall. The wall is supported by a 5 metre steel cable.



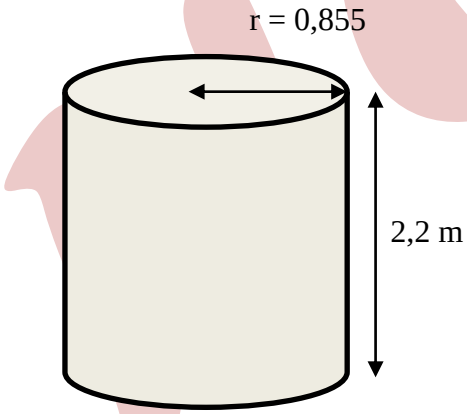
Use Pythagoras theorem to calculate BC, the distance between the foot of the wall le and the foot of the cable.

Formula: $BC^2 = AC^2 - AB^2$ (4)

4.3 The car wash captures rain water in water tanks to supplement their water supplies.

The water tank has the following dimensions:

- Radius (r) = 0,855 m
- Height (h) = 2,2 m



Formula: Volume = $\pi \times r^2 \times h$ Use π = 3,14
1 m^3 = 1 kℓ

4.3.1 Determine whether the car wash uses a 10 kℓ water tank? Justify your answer by showing ALL calculations. (6)

4.3.2 Calculate the surface area (SA) of the water tank.

Formula: $SA = (2 \times \pi \times r \times h) + (2 \times \pi \times r^2)$ (5)

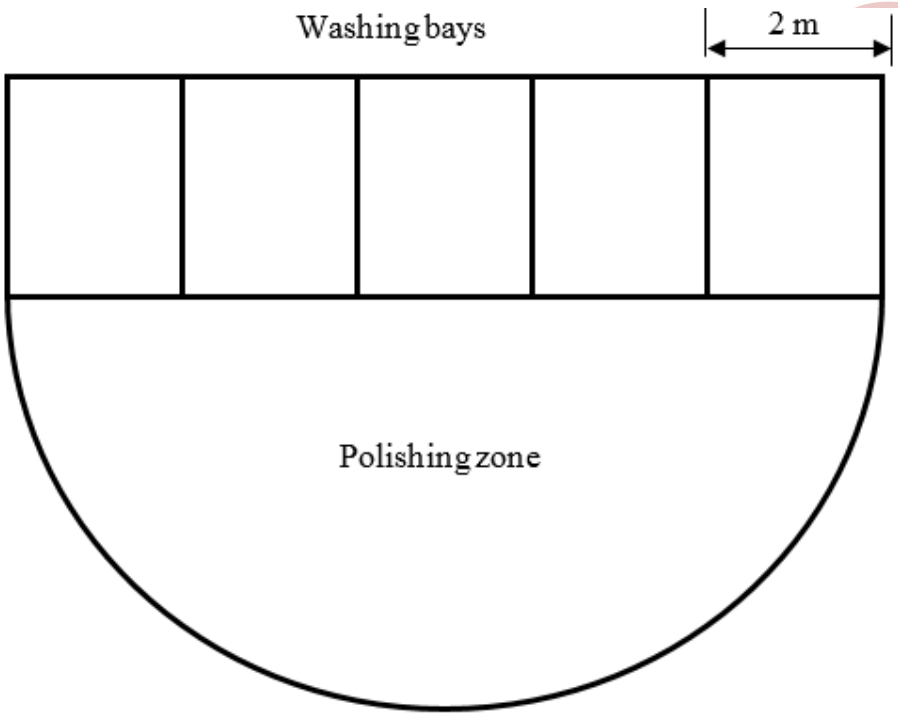
4.3.3 Give the ONE other way how this car wash could save water. (1)

4.4 The distance on a map between the car wash and the nearest grocery store is 20 cm.

Calculate the actual distance in kilometres if the scale of the map is 1:85 000. (4)

4.5 The car wash has 5 rectangular washing bays of equal areas and a semi-circular polishing zone. A washing bay has an area of 8 square metres and a breadth of 2 metres.

The washing bays and the polishing zone have the following layout and dimensions:



Formulae:

Area of rectangle = $\ell \times b$
Area of rectangle = 8 m^2
Area of circle = $\pi \times r^2$ Use π = 3,14

Study the above layout, dimensions and formulae to answer the questions.

4.5.1 Calculate the total area of all the washing bays. (2)

4.5.2 Calculate the length of one washing bay. (3)

4.5.3 Calculate the area of the polishing zone. (5)

4.5.4 Calculate the total area of the washing bays and polishing zone. (2)
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TOTAL: 150

ANSWER SHEET A **EXAMINATION NUMBER:**

QUESTION 1.2

VOLUME IN kℓ	**TARRIF per kℓ**	**CONSUMPTION CHARGE**
0 to 6	Free	
+6 to 10	R6,18	
+10 to 15	R9,97	
+15 to 20	R14,06	
+20 to 30	R18,46	
+30 to 40	R19,67	
> 40	R24,21 for each kℓ over 40	
	TOTAL:	

	/5

ANSWER SHEET B **EXAMINATION NUMBER:**

QUESTION 2.2.2