



# higher education & training

Department:  
Higher Education and Training  
**REPUBLIC OF SOUTH AFRICA**

## **NATIONAL CERTIFICATE (VOCATIONAL)**

### **MATHEMATICAL LITERACY (Second Paper) NQF LEVEL 4**

(10401034)

**6 November 2018 (Y-Paper)  
13:00–16:00**

**Drawing instruments will be used.**

**Calculators may be used.**

**This question paper consists of 10 pages and 1 addendum.**

<p><b>TIME: 3 HOURS</b> <b>MARKS: 150</b></p>
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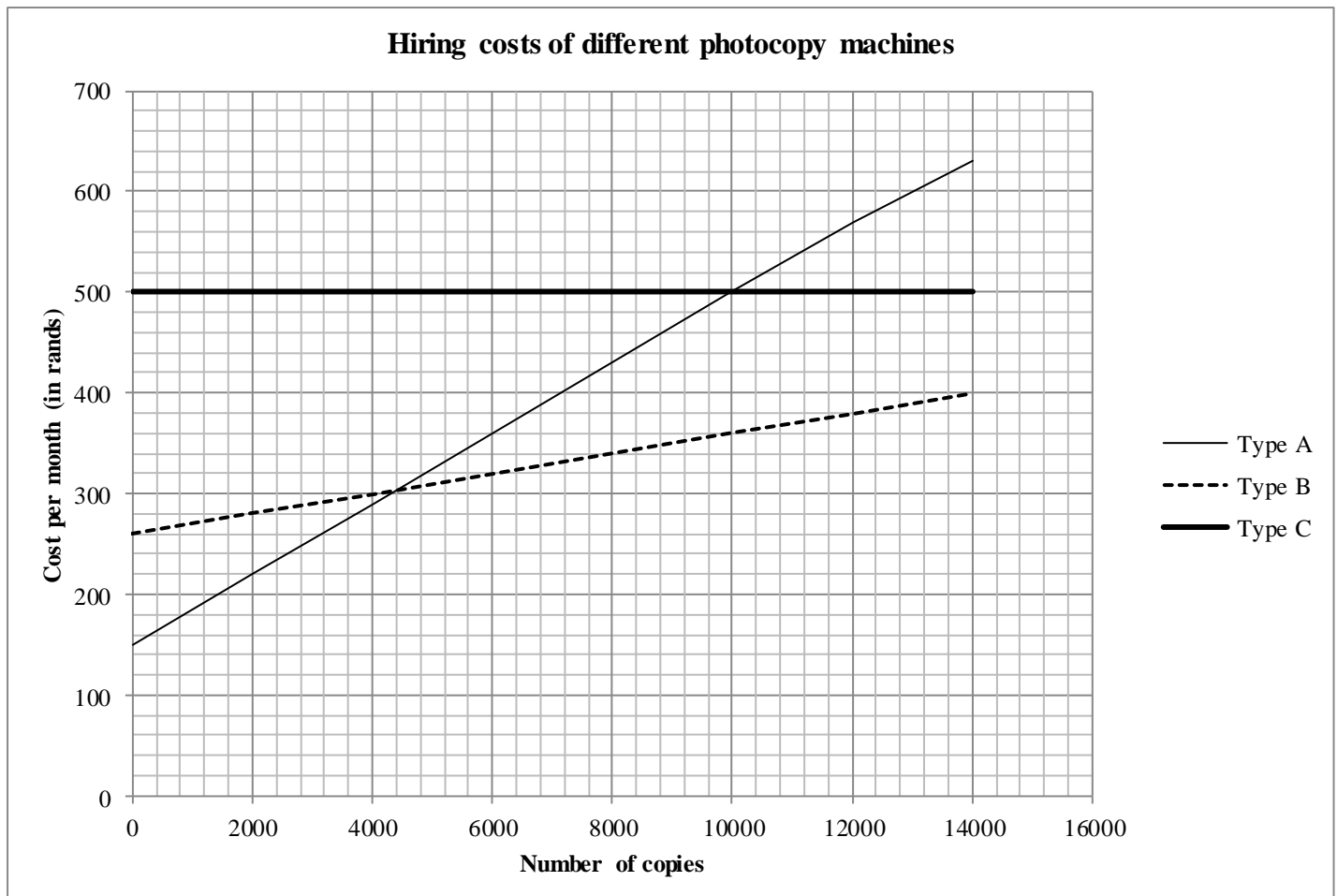
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## INSTRUCTIONS AND INFORMATION

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. Answer QUESTION 1.2.3 on the ADDENDUM.
  5. Clearly show ALL calculations, diagrams, graphs, et cetera used in determining the answers.
  6. Approved calculators may be used, unless otherwise stated.
  7. Round off the answers to TWO decimal places, unless otherwise stated.
  8. Use  $\pi = 3,14$ . Learners will be penalised if any other value is used.
  9. Drawing instruments including rulers, pairs of compasses and protractors may be used.
  10. Diagrams are not necessarily drawn to scale.
  11. Start each question on a NEW page.
  12. Write neatly and legibly.
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## QUESTION 1

- 1.1 A TVET College wants to hire an extra photocopy machine. The graph below shows the monthly costs for three different photocopy machines (Type A, Type B and Type C).



- 1.1.1 Determine the total cost for 12 000 copies if type B is being used. (2)
- 1.1.2 Calculate the difference in costs between type A and type C if 2 000 copies are to be made. (4)
- 1.1.3 Explain how the costing of type C differs from the other two types of machines. (3)
- 1.1.4 Determine the cost for 2 000 copies when using type A. (4)
- 1.1.5 Which type of photocopy machine will be the cheapest if less than 4 000 copies are made? (2)
- 1.1.6 Which type of photocopy machine will be the most expensive if between 4 000 and 10 000 copies are made? (2)
- 1.1.7 Explain why type A and type B do not start at zero (0) on the vertical axis. (2)

1.2 Private accommodation costs for students at a TVET college are as follow:

- Package A: R1 500 deposit and a monthly payment of R900
- Package B: R1 100 monthly

The cost of the accommodation is for 10 months only

1.2.1 Calculate the total accommodation cost for 6 months if a student chooses package A. (3)

1.2.2 Write down a formula to determine the accommodation costs for any number of months for Package A, in the form:

Accommodation costs in rand = ... (3)

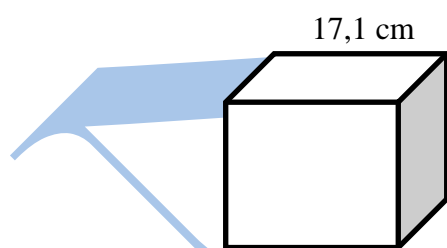
1.2.3 Draw a line graph for package A that shows the total cost to the number of months on the ADDENDUM (attached). The graph for package B is already drawn. (5)

1.2.4 What does the intersection of the two graphs mean? (2)

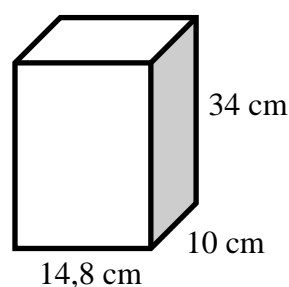
1.2.5 Which package deal would be more economical over a year? Explain your choice. (3)  
[35]

## QUESTION 2

2.1 Johnny examines two containers used in his company. The manufacturer claims that both containers can hold a capacity of 5 litres. Container A is in the shape of a cube with a side length of 17,1 cm and container B is in the shape of a rectangular prism with a length of 14,8 cm, a width of 10 cm and a height of 34 cm.



CONTAINER A:



CONTAINER B:

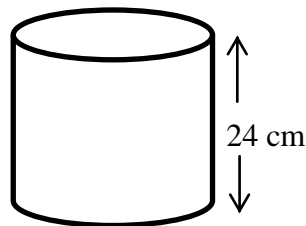
Note:

Volume = length  $\times$  breadth  $\times$  height  
1 litre = 1 000 cm<sup>3</sup>

Surface area = 2 (length  $\times$  width) + 2 (length  $\times$  height) + 2 (width  $\times$  height)

2.1.1 Prove, by showing all calculations, that each one of the containers can hold a capacity of 5 litres. (7)

- 2.1.2 Calculate the surface area of Container A. (4)
- 2.1.3 Calculate the surface area of Container B. (3)
- 2.1.4 Which one of the two containers will require less material for production? (2)
- 2.1.5 John brings in a regular cylindrical 5 litre tin which has a height (h) of 24 cm, as shown below.



Calculate the diameter of the tin using the following information:

$$\text{Volume} = \pi \times r^2 \times h$$

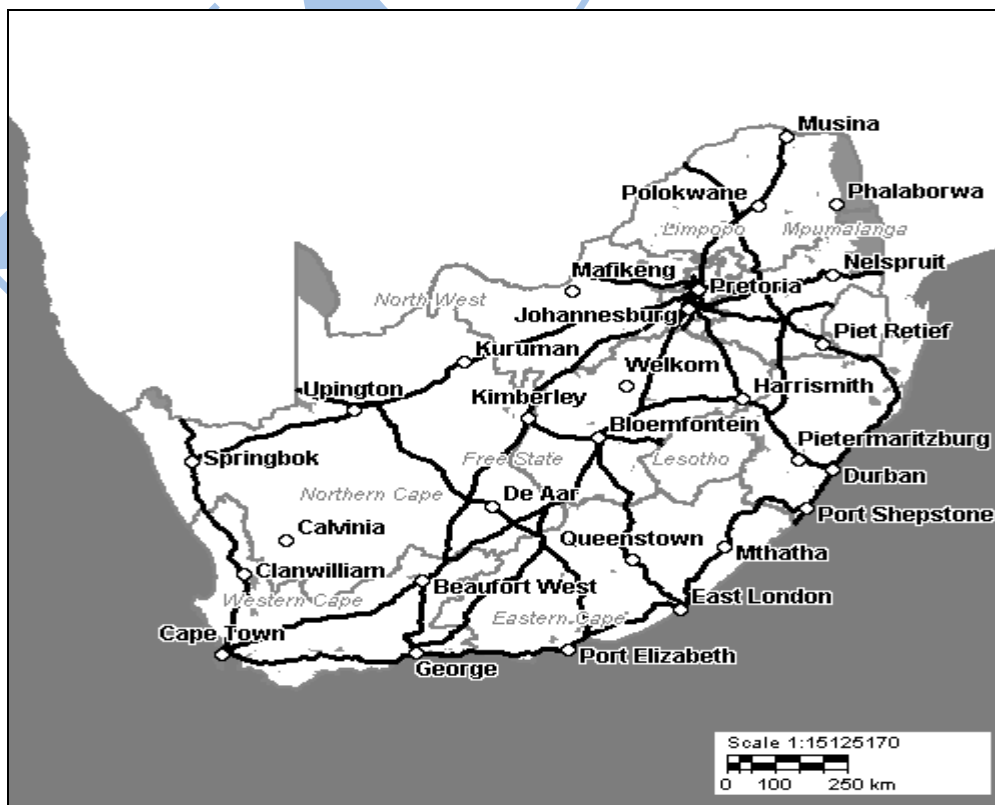
Use  $\pi = 3,14$  and where r = radius

h = height

(6)

- 2.2 The company for which Johnny is working has two branches, one in Cape Town and another one in George.

Use the map to answer the questions.

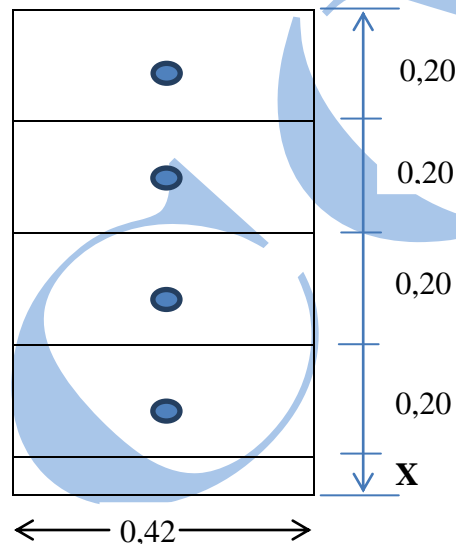


- 2.2.1 Determine the straight-line distance in mm (as the crow flies) between Cape Town and George. (2)
- 2.2.2 Use the bar scale to determine the actual distance between Cape Town and George. (4)
- 2.2.3 Calculate, in hours, how long it will take to drive a vehicle at 115 km/h from Cape Town to George.

Use the formula:  $\text{speed} = \frac{\text{distance in km}}{\text{time in hours}}$  (3)

2.3 The diagram below shows a chest of drawers.

The total height of the chest drawer is 0,95 m; and each drawer is 0,20 m.



- 2.3.1 Determine the height in cm of the base, marked with X. (3)
- 2.3.2 Explain why the measurements of a cabinet are usually given in millimetres. (2)
- 2.3.3 Choose the correct answer from those given in brackets. Write only the answer next to the question number.
- The actual chest drawer in reality is (one/two/three) dimensional. (2)
- 2.3.4 Justify your choice in QUESTION 2.3.3. (2)

[40]

**QUESTION 3**

- 3.1 Jamy wants to expand her catering business to a bakery. Her sales forecast in rand is shown in the table below.

	YEAR 1	YEAR 2
<b>Unit Sales</b>		
Baked goods	17620	21144
Sweets and Pastries	9400	12220
Catering	15	20
<b>Price per Unit</b>		
Baked goods	4	4
Sweets and pastries	3,15	<b>B</b>
Catering	1500	1500
<b>Sales</b>		
Baked goods	70480	84576
Sweets and pastries	29610	38493
Catering	22500	30000
<b>TOTAL SALES</b>	<b>122590</b>	<b>153069</b>
<b>Direct cost per Unit</b>		
Baked goods	2,50	2,50
Sweets and pastries	1,75	1,75
Catering	<b>A</b>	800
<b>Direct Cost</b>		
Baked goods	44050	52860
Sweets and pastries	16450	21385
Catering	12000	16000
<b>TOTAL DIRECT COST</b>	<b>72500</b>	<b>C</b>
<b>Gross profit</b>	<b>50090</b>	<b>D</b>
<b>Gross profit %</b>	69,0%	<b>E</b>

- 3.1.1 How is the amount of R70 480 calculated? (2)
- 3.1.2 Write, as a ratio, in its simplest form the number of catering events of year 1 to that of year 2. (2)
- 3.1.3 The direct total cost of catering for year 1 is R12 000. What is the direct cost per unit for one catering event, the value of A? (3)
- 3.1.4 Determine the average price per unit sold of sweets and pastries, the value of B. (3)
- 3.1.5 Determine the value of C and D. (4)

- 3.1.6 Jamy's friend argues that because the total sales are higher than that of year 1 the percentage gross profit will differ by more than 2%. By first calculating the value of E, determine if her friend is correct or not.

$$\text{Formula: Gross profit \%} = \frac{\text{Profit}}{\text{Total direct cost}} \times 100\%$$

(5)

- 3.1.7 Prove, by showing ALL calculations, that there is a 20% planned percentage increase in the number of baked goods to be sold from year 1 to year 2.

(3)

- 3.1.8 Name any TWO expenses to consider for the bakery business.

(2)

- 3.2 Jamy is considering a short-term loan from a local bank to expand her bakery business. The following loan repayment table is given to her. The four loan options given are R 12 000, R 15 000, R30 000 and R 50 000.

Use the table to answer the questions.

Loan Repayment Table				
Loan Amount	R12 000	R15 000	R30 000	R50 000
Loan term (months)	36	42	48	60
Fixed monthly repayment	R677	R758	R1 319	R1 948
Monthly instalment as a % the loan amount	5,6%	5,1%	4,4%	Y
Total repayment	R24 372	R31 836	X	Z

- 3.2.1 The loan term is normally given in months, express the loan term for the loan amount of R15 000 in years only.

(2)

- 3.2.2 Show how the total repayment of R24 372 for a loan amount of R 12 000 is calculated.

(2)

- 3.2.3 Jamy claims that the total repayment will be more than double the original amount on a loan of R30 000. Determine the value of X to verify if her statement is correct.

(4)

- 3.2.4 Determine the value of Y, the monthly instalment, as a percentage of the loan amount.

(3)

- 3.2.5 Calculate the value of Z and hence determine how much interest will be paid on a loan of R50 000.

(5)

**[40]**



**QUESTION 4**

The two sets of data below show the weight (in kg) of rugby players in a game between South Africa and New Zealand . The weights of players numbered 1 to 15 are shown in the table below:

Player Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<b>South Africa (Springboks)</b>	116	114	121	117	120	103	114	114	90	97	94	101	95	90	90
<b>New Zealand (All Blacks)</b>	120	103	120	117	122	108	108	112	83	91	96	106	95	91	96

- 4.1 What is the weight, in pounds, of the heaviest South African player?  
1 pound = 0.4536 kilogram (3)
- 4.2 What is the modal value of the weight of the South African team? (2)
- 4.3 The range for the weights of the South African team is 31 kg. Determine the range for the weights of the New Zealand team. (3)
- 4.4 The median weight for the New Zealand team is 106 kg. Determine the median weight for the South African team. (1)
- 4.5 Evaluate if there is a significant difference in the mean (average) weights between the two teams. (7)
- 4.6 If a player is selected at random, what is the probability of selecting a player that weighs 96 kg in the New Zealand team?  
Write your answer as a percentage. (4)
- 4.7 If a player is selected at random what is the probability of selecting a player with a weight of more than a 100 kg in the South African team?  
Write your answer in its simplest form. (3)

- 4.8 After the game 50 people from the crowd were chosen to take part in a competition. The table below shows the team that they supported during this game with some of them remaining neutral.

	South Africa	Neutral	New Zealand	Total
Male	10	A	18	B
Female	13	5	2	20
Total	C	7	20	50

- 4.8.1 Determine the value of A, B and C (3×2) (6)
- 4.8.2 If a person from the competition is chosen at random, what is the probability of choosing a female? (2)
- 4.8.3 If a person from the competition is chosen at random, what is the probability of choosing a male that supports South Africa? (2)
- 4.8.4 If a female from the competition is chosen at random, what is the probability of choosing someone who supports New Zealand? (2)

[35]

**TOTAL: 150**

**ADDENDUM : QUESTION 1.2.3****EXAMINATION NUMBER:**

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**CENTRE NUMBER:**

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