



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 11

MATHEMATICS

TEST NO 3

18 SEPTEMBER 2026

MARKS: 100

TIME: 2 Hours

This question paper consists of 8 pages.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of SIX questions.
2. Read the questions carefully.
3. Answer ALL the questions.
4. Number your answers exactly as the question are numbered.
5. Clearly show ALL calculations, diagrams and graphs, etc. which you have used in determining your answers.
6. ANSWERS ONLY will not necessarily be awarded full marks.
7. You may use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.
8. If necessary, answers should be rounded off to TWO decimal places, unless stated otherwise.
9. Diagrams are NOT necessarily drawn to scale
10. Write neatly and legibly.

QUESTION 1

1.1 Given : $k(x) = \frac{\sqrt{3x-5}}{x-3}$

1.1.1 For which values of x will $k(x)$ be real? (3)

1.1.2 Solve for x if $k(x) = 1$ (6)

1.2 Solve for x :

1.2.1 $3x^2 + 5x = 4$ (correct to two decimal places) (4)

1.2.2 $\sqrt{(x-2)^{-3}} = 64$ (4)

1.3 Given: $f(x) = x^2 + 3x - 4$

1.3.1 Calculate $f(2)$. (1)

1.3.2 Determine values x of for which $f(x) < 0$. (4)

1.4 Show that the roots of the equation $x(6x - 7m) = 5m^2$ are real, rational and unequal if $m \neq 0$. (4)

[26]

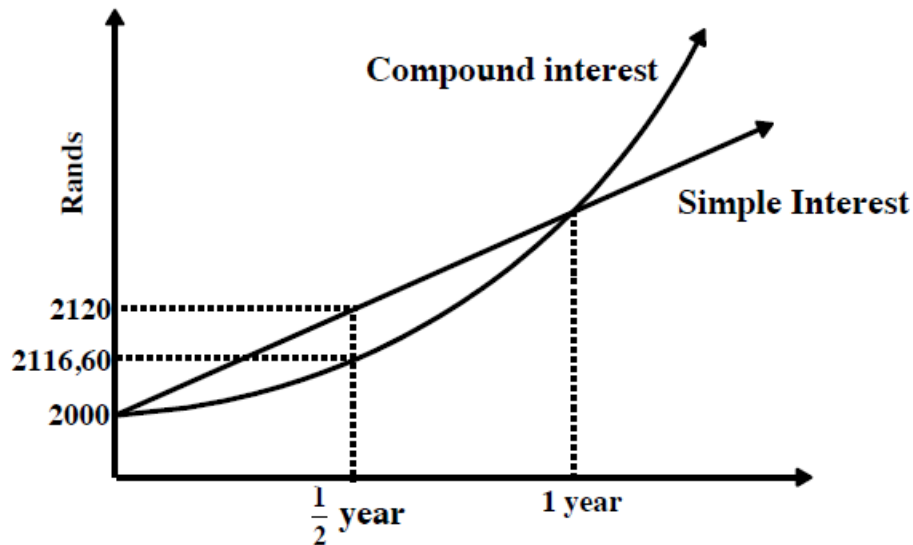
QUESTION 2

- 2.1 R 2 500 is deposited into a savings account at 15 % interest per annum compounded monthly.
- 2.1.1 What is monthly nominal interest rate? (2)
- 2.1.2 Determine the effective yearly interest rate, correct to one decimal place. (4)
- 2.1.3 Calculate the amount of money in the savings account at the end of seven years (3)
- 2.2 Sipho invested R 30 000 at an interest of 12 % p.a., simple interest. After n years, the accumulated value of his investment was R 51 600. Calculate the value of n . (3)
- 2.3 Mr Tladi invested R10 050 on the 1 September 2022 in an account that paid interest at the rate of $x\%$ p.a., compounded quarterly. The accumulated amount in the account on the 1 September 2026 was R13 867. Calculate the value of x in percentage. (4)
- 2.4 Mrs Johannes invested R 50 000 in a savings for 7 years. The investment earned interest at the rate of 14% p.a., compounded monthly for the first three years. The rate of interest changed to 13% p.a., compounded half-yearly, for the remaining four years. Mrs Johannes withdrew R 6 032 from the account 5 years after making the initial deposit.
- 2.4.1 Calculate the accumulated amount in the account three years after making initial deposit. (3)
- 2.4.2 Calculate the accumulated amount in the savings account at the end of the seven-year period. (4)

[23]

QUESTION 3

The sketch below shows two options offered Joe to invest his money.



- 3.1 How much can Joe invest? (1)
- 3.2 If the average rate of price increase of the investment is 12% p.a for 5 years:
- 3.2.1 Calculate the future value for both options and show the best option. (5)
- 3.2.2 Joe decided to invest using simple interest for two years. Thereafter, he invests the accumulated amount for another three years using compound interest. Calculate how much money he will have saved at the end of the five year period. (4)

[10]

QUESTION 4

The manager of a hotel in Polokwane recorded the number of guest sitting down for breakfast, lunch and supper on a particular day. Of the 300 guests:

- 29 did not arrive for any of the three meals.
- 153 were at breakfast
- 161 were at lunch
- 145 were at supper
- 95 were at breakfast and lunch
- 80 were at lunch and supper
- 52 were at supper but did not arrive for the other two meals
- 70 were at all meals

4.1 Draw a Venn diagram. (8)

4.2 Calculate the probability that a guest chosen at random will have:

4.2.1 been at both breakfast and lunch, but not supper. (2)

4.2.2 been at both breakfast and lunch. (2)

4.2.3 been at breakfast only. (2)

4.3.4 been at one or more of the meals. (2)

[16]

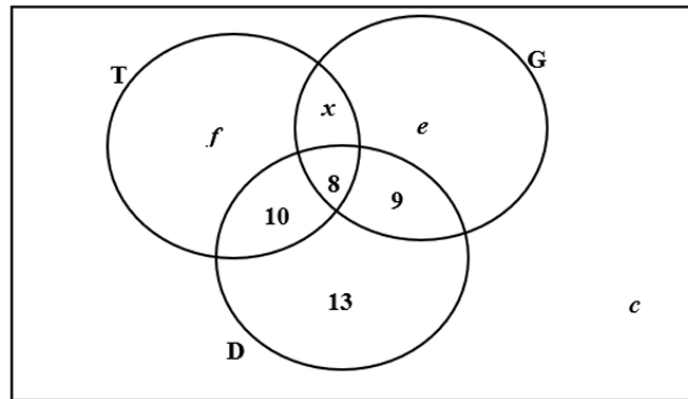
QUESTION 5

- 5.1 A survey regarding the most read magazine(s) was conducted among 84 high school boys. Three magazines, namely Glamour (G), Drum (D) and Teen Vogue (T) were used for the survey.

The results were as following:

- 41 read Teen Vogue (T)
- 34 read Glamour (G)
- 40 read Drum (D)
- 18 read Teen Vogue and Drum
- 8 read all three magazines
- 75 read at least one of the magazines
- $(G \text{ and } D) = 17$

The Venn diagram below demonstrates the above information.



- 5.1.1 Write down the value of c . (1)
- 5.1.2 Express f in terms of x . (2)
- 5.1.3 If $e = 17 - x$, determine the numerical value of x . (4)
- 5.2 Each passenger on a certain Banana Airways flight choose exactly one beverage from tea, coffee or fruit juice. The results are shown in the table below:

	MALE	FEMALE	TOTAL
TEA	20	40	60
Coffee	b	c	80
Fruit juice	d	e	20
TOTAL	60	100	a

- 5.2.1 Write down the value of a . (1)
- 5.2.2 What is the probability that a randomly selected passenger is male? (2)
- 5.2.3 Given that the event of passenger choosing coffee is independent of being a male, calculate the value of b . (4)

[14]

QUESTION 6

- 6.1 A box contains 3 blue marbles and 2 red marbles. A marble is taken from the box, the colour is recorded and the marble is put aside. A second marble is taken from the box, the colour is recorded and then put aside.
- 6.1.1 Draw a tree diagram to represent the information above. Show the probabilities associated with EACH branch, as well as the possible outcomes. (3)
- 6.1.2 Determine the probability of first taking a red marble and then taking a blue marble, in that order. (2)
- 6.2 A and B are two events. The probability that event A will occur is 0,4 and the probability that event B will occur is 0,3 . The probability that either event A or event B will occur is 0,58 .
- 6.2.1 Are events A and B mutually exclusive?
Justify your answer with appropriate calculations. (3)
- 6.2.2 Are events A and B independent?
Justify your answer with appropriate calculations. (3)

[11]**TOTAL:100**