



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

MATHEMATICS N1

26 November 2024

This marking guideline consists of 9 pages.

INSTRUCTIONS TO MARKERS

1. Mark all the questions.
 2. Follow the answers according to the numbering system used in this question paper.
 3. Only use a red pen.
 4. Make your ticks and crosses neatly and legibly.
 5. Follow the instructions on how to allocate marks for each question.
-

QUESTION 1

1.1 1.1.1 $(b^3)^{a+c} \times (b^3)^{-a-c}$
 $= b^{3a+3c} \checkmark \cdot b^{-3a-3c} \checkmark$
 $= b^{3a-3a+3c-3c}$
 $= b^0 \checkmark$
 $= 1 \checkmark$

Instructions:

- Allocate marks as indicated

(4)

1.1.2 $x^3y^2 \div yx^2 \times \frac{xy}{2}$
 $= \frac{x^3y^2}{x^2y} \times \frac{xy}{2}$
 $= \frac{x^4y^3}{2x^2y} \checkmark$
 $= \frac{x^2y^2}{2} \checkmark$

Instructions:

- 1 mark for the numerator x^4y^3
- 1 mark for the denominator $\frac{1}{2x^2y}$
- 1 mark for the final answer

Alternative answer:

$$= \frac{x^3y^2}{x^2y} \times \frac{xy}{2}$$

$$= xy \checkmark \times \frac{xy}{2}$$

$$= \frac{x^2y^2}{2} \checkmark$$

Instructions for alternative answer:

- 2 marks for xy
- 1 mark for the final answer

(3)

1.2 $-5 \log_5 \frac{1}{25}$
 $= -5 \log_5 5^{-2} \checkmark$
 $= (-5)(-2) \log_5 5 \checkmark$
 $= 10(1) \checkmark$
 $= 10 \checkmark$

Instructions:

- Allocate marks as indicated
- (1 mark for answer only, as question states without a calculator)

(4)

1.3 $\log_5(5x - 15) = 2$
 $(5x - 15) = 5^2 \checkmark$
 $5x = 25 + 15 \checkmark$
 $5x = 40$
 $\frac{5x}{5} = \frac{40}{5} \checkmark$
 $\therefore x = 8 \checkmark$

Instructions:

- Allocate marks as indicated
- 1 mark for rewriting in exponential form
- 1 mark for moving 15
- 1 mark for dividing by 5
- 1 mark for the final answer

(4)

[15]

QUESTION 2

2.1

$$\begin{array}{r}
 8x^2 \checkmark + 19x \checkmark - 12 \checkmark \\
 x + 2 \overline{) 8x^3 + 35x^2 + 26x - 24 \checkmark} \\
 \underline{-(8x^3 + 16x^2) \checkmark} \\
 19x^2 + 26x \\
 \underline{-(19x^2 + 38x) \checkmark} \\
 -12x - 24 \\
 \underline{-(-12x - 24) \checkmark} \\
 0
 \end{array}$$

Instructions:

- Allocate marks as indicated
- 1 mark for descending form of expression

(7)

2.2

$$\begin{array}{r}
 7x^2 \quad - 3xy \quad + 9y^2 \\
 \underline{-(-3x^2 - 17xy + 13y^2)} \\
 10x^2 \checkmark + 14xy \checkmark - 4y^2 \checkmark
 \end{array}$$

Instructions:

- Allocate marks as indicated
- (3 marks for answer only)

Alternative answer:

$$\begin{aligned}
 &= 7x^2 - 3xy + 9y^2 - (-3x^2 - 17xy + 13y^2) \\
 &= 7x^2 - 3xy + 9y^2 + 3x^2 + 17xy - 13y^2 \\
 &= 7x^2 + 3x^2 - 3xy + 17xy + 9y^2 - 13y^2 \\
 &= 10x^2 \checkmark + 14xy \checkmark - 4y^2 \checkmark
 \end{aligned}$$

(3)

2.3

$$\begin{aligned}
 &3(x + 1)(x - 2) \\
 &= (3x + 3)(x - 2) \\
 &= 3x^2 - 6x + 3x - 6 \\
 &= 3x^2 \checkmark - 3x \checkmark - 6 \checkmark
 \end{aligned}$$

Instructions:

- 3 marks for the final answer

Alternative answer:

$$\begin{aligned}
 &= 3(x^2 - 2x + x - 2) \\
 &= 3(x^2 - x - 2) \\
 &= 3x^2 \checkmark - 3x \checkmark - 6 \checkmark
 \end{aligned}$$

Instructions for alternative answer:

- 3 marks for the final answer

[13]

QUESTION 3

3.1

3.1.1

$$\begin{aligned}
 &7a + 14 - 2b - ab \\
 &= (7a + 14) + (-2b - ab) \checkmark \\
 &= 7(a + 2) - b(2 + a) \checkmark \\
 &= (a + 2)(7 - b) \checkmark
 \end{aligned}$$

Instructions:

- Allocate marks as indicated

Alternative answer:

$$\begin{aligned}
 &7a + 14 - 2b - ab \\
 &= (7a - ab) + (14 - 2b) \checkmark \\
 &= a(7 - b) + 2(7 - b) \checkmark \\
 &= (7 - b)(a + 2) \checkmark
 \end{aligned}$$

Instructions for alternative answer:

- Allocate marks as indicated

(3)

3.1.2

$$\begin{aligned}
 &9x^3y^4z^2 - 18x^2y^3z - 36xy^2 \\
 &= 9x^2y^2z^2 \checkmark - 18xy^2z \checkmark - 36xy^2 \checkmark
 \end{aligned}$$

Instructions:

- Allocate marks as indicated

$$\begin{aligned}
 3.2 \quad & \frac{3}{4x^2} + \frac{1}{x} - \frac{5}{8x} \\
 &= \frac{3(2) + 1(8x) - 5(x)}{8x^2} \\
 &= \frac{6\checkmark + 8x\checkmark - 5x\checkmark}{8x^2\checkmark} \\
 &= \frac{6 + 3x}{8x^2}\checkmark
 \end{aligned}$$

Instructions:

- 1 mark for denominator/ LCM $8x^2$
- 1 mark for numerator 6
- 1 mark for numerator $8x$
- 1 mark for numerator $-5x$
- 1 mark for the final answer

(5)

$$\begin{aligned}
 3.3 \quad 3.3.1 \quad & 30x^7y^2z^5 = 2 \times 3 \times 5 \times x^7y^2z^5\checkmark \\
 & 105x^3y^4z = 3 \times 5 \times 7 \times x^3y^4z\checkmark \\
 & \text{Alternative answer:} \\
 & = 2 \times 3 \times 5 \times xxxxxxxyyzzzzz\checkmark \\
 & = 3 \times 5 \times 7 \times xxxyyyyz\checkmark
 \end{aligned}$$

Instructions:

- Allocate marks as indicated
- Do not allocate marks if the variables are missing

Instructions for alternative answer:

- Allocate marks as indicated

(2)

$$\begin{aligned}
 3.3.2 \quad & \text{LCM} = 2 \times 3 \times 5 \times 7 \times x^7y^4z^5 \\
 & \text{LCM} = 210\checkmark x^7y^4z^5\checkmark
 \end{aligned}$$

Instructions:

- 1 mark for 210
- 1 mark for $x^7y^4z^5$
- (2 marks for answer only)

(2)

$$\begin{aligned}
 3.3.3 \quad & \text{HCF} = 3 \times 5 \times x^3y^2z \\
 & \text{HCF} = 15\checkmark x^3y^2z\checkmark
 \end{aligned}$$

Instructions:

- 1 mark for 15
- 1 mark for x^3y^2z
- (2 marks for answer only)

(2)

[18]

QUESTION 4

$$\begin{aligned}
 4.1 \quad & 12(y - 3) - 3(y - 9) = -5(y + 6) \\
 & 12y - 36\checkmark - 3y + 27\checkmark = -5y - 30\checkmark \\
 & 12y - 3y + 5y = 36 - 27 - 30 \\
 & 14y = -21\checkmark \\
 & 14y = \frac{-21}{14} \\
 & \therefore y = \frac{-3}{2}\checkmark \text{ or } \therefore y = -1,5
 \end{aligned}$$

Instructions:

- Allocate marks as indicated

(5)

$$\begin{aligned}
 4.2 \quad & ax + y^2 = c \\
 & y^2 = c - ax\checkmark \\
 & y = \sqrt{c - ax}\checkmark
 \end{aligned}$$

Instructions:

- Allocate marks as indicated
 - Do not penalise if the subject is on the RH side
- $$\sqrt{x - ax} = y$$

4.3 $y = \sqrt{c - ax}$
 $y = \sqrt{33 - (-2)33} \checkmark$
 $y = 9,950 \checkmark$

Instructions:

- 1 mark for substitution
- 1 mark for the answer
- (1 mark for answer only) (2)

4.4 $v = \frac{s}{t} \checkmark$
 $v = \frac{9000}{8} \checkmark$
 $v = 1125 \text{ km/h} \checkmark$

Instructions:

- 1 mark for formulae
- 1 mark for substitution
- 1 mark for the answer

Alternative answer:

$v = \frac{s}{t} \checkmark$
 $v = \frac{9000 \times 1000}{8 \times 60 \times 60} \checkmark$
 $v = 312,5 \text{ m/s} \checkmark$

Instructions for alternative answer:

- 1 mark for formulae
- 1 mark for substitution
- 1 mark for the answer (3)

4.5 Let the number be x .
 $15x - 3000 = 0 \checkmark$
 $15x = 3000 \checkmark$
 $15x = \frac{3000}{15} \checkmark$
 $\therefore x = 200 \checkmark$

Instructions:

- 1 mark for equation
- 1 mark for moving 3000
- 1 mark for dividing by 15
- 1 mark for the answer
- (2 marks for answer only) (4)

QUESTION 5

5.1 5.1.1 $\frac{x}{-2} + \frac{y}{3} = 1$
 $\frac{y}{3} = \frac{x}{2} + 1$
 $y = \frac{3}{2}x \checkmark + 3 \checkmark$

Instructions:

- Allocate marks as indicated (do not penalise if answer is written as $y = \frac{3x}{2} + 3$)
- (2 marks for answer only) (2)

5.1.2 $m = \frac{3}{2} \checkmark$

Instructions:

- Do not penalise if answer is written as $m = 1,5$ (1)

5.1.3 $c = 3 \checkmark$

Alternative answer:

$c = (0; 3) \checkmark$ (1)

5.2 5.2.1 $xy = -3$
 $y = -\frac{3}{x}$ ✓

Instructions:

- 1 mark for answer only

(1)

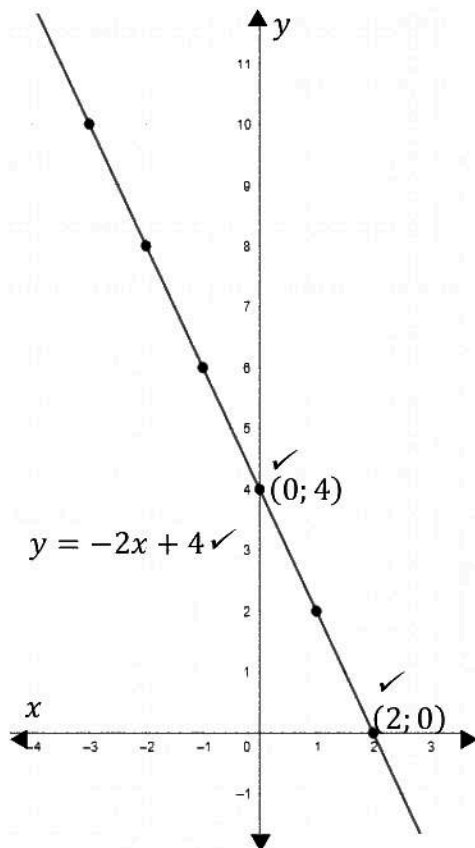
5.2.2 2nd ✓ and 4th ✓ quadrant

(2)

5.2.3 Hyperbola ✓

(1)

5.3



Instructions:

Table:

	✓					✓
x	-3	-2	-1	0	1	2
y	10	8	6	4	2	0

- 1 mark for the correct starting values on the table (-3; 10)
- 1 mark for the correct ending values on the table (2; 0)

Graph:

- 1 mark for writing the equation standard next to the graph
- 1 mark for the correct x -intercept drawn (2; 0)
- 1 mark for the correct y -intercept drawn (0; 4)

(5)
[13]

QUESTION 6

- 6.1
- Side, side, side (S, S, S)
 - Side, included angle, side (S, $\angle$, S)
 - Angle, side angle or angle, angle, side ($\angle$, $\angle$, S)
 - Right angle, hypotenuse, side (90°, hypotenuse, S)

Instructions:

- 2 marks for any TWO answers

(2)

6.2 $AC^2 = AB^2 - BC^2$ ✓
 $AC^2 = (60)^2 - (20)^2$ ✓
 $AC = \sqrt{(60)^2 - (20)^2}$
 $AC = 56,569 \text{ cm}$ ✓

Instructions:

- 1 mark for theorem
- 1 mark for substitution
- 1 mark for the answer
- (2 marks for answer only)

- 6.3 Two sides are equal. ✓
Two angles are equal. ✓

Instructions:

- Allocate marks as indicated

(2)
[7]

QUESTION 7

7.1

$$\cos 3^\circ \checkmark = \frac{6}{x} \checkmark$$

$$x \cos 3^\circ = 6$$

$$x = \frac{6}{\cos 3^\circ} \checkmark$$

$$x = 6,008 \text{ m} \checkmark$$

Alternative answer:

$$\sec 3^\circ \checkmark = \frac{x}{6} \checkmark$$

$$x = 6 \sec 3^\circ$$

$$x = \frac{6}{\cos 3^\circ} \checkmark$$

$$x = 6,008 \text{ m} \checkmark$$

Instructions:

- 1 mark for $\cos 3^\circ$
- 1 mark for $\frac{6}{x}$
- 1 mark for $\frac{6}{\cos 3^\circ}$
- 1 mark for the final answer
- Do not penalise if the unit is not indicated

Instructions for alternative answer:

- 1 mark for $\sec 3^\circ$
- 1 mark for $\frac{x}{6}$
- 1 mark for $\frac{6}{\cos 3^\circ}$
- 1 mark for the final answer
- Do not penalise if the unit is not indicated

(4)

7.2

$$\frac{\cos 30^\circ}{\sin 60^\circ}$$

$$= \cos 30^\circ \div \sin 60^\circ$$

$$= \frac{\sqrt{3}}{2} \checkmark \div \frac{\sqrt{3}}{2} \checkmark$$

$$= 1 \checkmark$$

Instructions:

- 2 marks for correct fractions
- 1 mark for the final answer
- (1 mark for answer only)

(3)
[7]

QUESTION 8

8.1

$$A = b \times \perp h$$

$$A = 2,5 \times 1,8 \checkmark$$

$$A = 4,5 \text{ m}^2 \checkmark$$

Instructions:

- 1 mark for substituting values
- 1 mark for the final answer
- (2 marks for answer only)
- Do not penalise if the unit is not indicated

(2)

8.2 8.2.1 $P = S + S + S$
 $P = 4 + 20,616 + 21 \checkmark$
 $P = 45,616 \text{ m} \checkmark$

Instructions:

- 1 mark for substituting values
- 1 mark for the final answer
- (2 marks for answer only)
- Do not penalise if the unit is not indicated

8.2.2 $A = l \times b$
 $A = 12 \times 21 \checkmark$
 $A = 252 \text{ m}^2 \checkmark$

Instructions:

- 1 mark for substituting values
- 1 mark for the final answer
- (2 marks for answer only)
- Do not penalise if the unit is not indicated

8.2.3 $V = \frac{1}{2} b \times h \times l$
 $V = \frac{1}{2} (20,616)(4)(12) \checkmark$
 $V = 494,784 \text{ m}^3 \checkmark$

Instructions:

- 1 mark for substituting values
- 1 mark for the final answer
- (2 marks for answer only)
- Do not penalise if the unit is not indicated

(3 × 2) (6)

8.3 The amount of money saved:
 $= R12\,588 - R10\,999$
 $= R1\,589 \checkmark$

Instructions:

- 1 mark for R1 589
- 1 mark for calculation
- 1 mark for percentage
(do not allocate mark if the % symbol is not indicated)

The percentage of money saved:
 $= \frac{1\,589}{12\,588} \times 100 \checkmark$
 $= 12,623\% \checkmark$

(3)

[11]

TOTAL: 100