



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

MATHEMATICS N1

6 August 2026

This marking guideline consists of 10 pages.

QUESTION 1

1.1 1.1.1 $9 \log_x \sqrt[3]{x} + \log_{10} 100 - \log_7 1$
 $= 9 \log_x x^{\frac{1}{3}} + \log_{10} 10^2 - 0 \checkmark$
 $= (9) \left(\frac{1}{3}\right) \log_x x \checkmark + 2 \log_{10} 10 \checkmark$
 $= 3(1) + 2(1)$
 $= 5 \checkmark$

Instructions:

- 1 mark for $-\log_7 1 \rightarrow 0$
- 1 mark for $(9) \left(\frac{1}{3}\right) \log_x x$ or $3 \log_x x$
- 1 mark for $2 \log_{10} 10$
- 1 mark for final answer
- (1 mark for answer only, question states without a calculator)

(4)

1.1.2 $\log_7 \frac{28}{4} + \log_7 343 - \log_7 7^{-1}$
 $= \log_7 7 \checkmark + \log_7 343 + \log_7 7 \checkmark$
 $= 1 + \log_7 7^3 \checkmark + 1$
 $= 3 + 2$
 $= 5 \checkmark$

Instructions:

- 1 mark for $+\log_7 7$
- 1 mark for $\log_7 2 \ 401$
- 1 mark for $4 \log_7 7$
- 1 mark for final answer
- (1 mark for answer only, question states without a calculator)

(4)

1.2 $\log_y z = x$
 $y^x = z \checkmark$

(1)

1.3 $q^r = s$
 $\log_q s = r \checkmark$

(1)

1.4 1.4.1 $8^{\frac{2}{3}} \times 16^{-\frac{1}{2}}$
 $= \left(2^{3 \times \frac{2}{3}}\right) \times \left(2^{4 \times -\frac{1}{2}}\right)$
 $= 2^2 \checkmark \times 2^{-2} \checkmark$
 $= 1 \checkmark$

Instructions:

- 1 mark 2^2
- 1 mark for 2^{-2}
- 1 mark for final answer
- (0 marks for answer only, question states without a calculator)

(3)

1.4.2 $\frac{12x^5y}{x^6y^3} \times \frac{x^4}{8y^2}$
 $= \frac{12x^9y \checkmark}{4x^6y^5 \checkmark} \text{ or } = \frac{3 \times 4x^9y \checkmark}{4x^6y^5 \checkmark}$
 $= \frac{3x^3}{2y^4} \checkmark$

Instructions:

- Allocate marks as indicated

(3)

[16]

QUESTION 2

2.1

$$\begin{array}{r}
 9a^2 \checkmark - 5b^3 \checkmark \\
 2a^2 + 3b^3 \overline{) \begin{array}{l} 18a^4 + 17a^2b^3 - 15b^6 \\ -(18a^4 + 27a^2b^3) \checkmark \\ \hline -10a^2b^3 - 15b^6 \\ -(-10a^2b^3 - 15b^6) \checkmark \\ \hline 0 \end{array}}
 \end{array}$$

Alternative method:

$$\begin{aligned}
 & (2a^2 + 3b^3)(9a^2 - 5b^3) \\
 &= 18a^4 + 27a^2b^3 - 10a^2b^3 - 15b^6 \checkmark \\
 &= 18a^4 \checkmark + 17a^2b^3 \checkmark - 15b^6 \checkmark
 \end{aligned}$$

Instructions:

- Allocate marks as indicated

Instructions for alternative answer:

- Allocate marks as indicated

(4)

2.2

$$\begin{aligned}
 & -(x+2)x - [4x - (6x+1)] \\
 &= -x(x+2) - [4x - 6x - 1] \\
 &= -x^2 - 2x - [-2x - 1] \\
 &= -x^2 - 2x \checkmark + 2x + 1 \checkmark \\
 &= -x^2 \checkmark + 1 \checkmark
 \end{aligned}$$

Alternative method:

$$\begin{aligned}
 & -(x+2)x - [4x - (6x+1)] \\
 &= (-x-2)x - [4x - 6x - 1] \\
 &= -x^2 - 2x - 4x + 6x + 1 \\
 &= -x^2 - 2x \checkmark + 2x + 1 \checkmark \\
 &= -x^2 \checkmark + 1 \checkmark
 \end{aligned}$$

Instructions:

- 1 mark for simplifying first term: $-x^2 - 2x$
- 1 mark for simplifying second term: $2x + 1$
- 2 marks for final answer
- (2 marks for answer only)

Instructions:

- 1 mark for simplifying first term: $-x^2 - 2x$
- 1 mark for simplifying second term: $2x + 1$
- 2 marks for final answer

(2 marks for answer only)

(4)

2.3

$$\begin{array}{r}
 -6x^2 + 5x - 9 \\
 -(2x^2 + 7x - 13) \\
 \hline
 -8x^2 \checkmark - 2x \checkmark + 4 \checkmark
 \end{array}$$

(3)

[11]

QUESTION 3

3.1

3.1.1

$$\begin{aligned}
 & 3y^2(18x^2y^8 - 4y^2) + 30xy^6 \\
 &= 54x^2y^{10} + 12y^4 \checkmark + 30xy^6 \\
 &= 6y^4 \checkmark (9x^2y^6 - 2 + 5xy^2) \checkmark
 \end{aligned}$$

Instructions:

- 1 mark for simplifying brackets
- 1 mark for HCF
- 1 mark for bracket

(3)

$$\begin{aligned}
 3.1.2 \quad & (2xy - 4) - 28a + 14axy \\
 & = (2xy - 4) + (14axy - 28a) \\
 & = 2(xy - 2) \checkmark + 14a(xy - 2) \checkmark \\
 & = (xy - 2) \checkmark (2 + 14a) \checkmark \\
 & = 2(1 + 7a)(xy - 2) \checkmark
 \end{aligned}$$

Alternative method:

$$\begin{aligned}
 & 2xy - 4 - 28a + 14axy \\
 & = (2xy + 14axy) + (-4 - 28a) \\
 & = 2xy(1 + 7a) \checkmark - 4(1 + 7a) \checkmark \\
 & = (1 + 7a) \checkmark (2xy - 4) \checkmark \\
 & = 2(xy - 2)(1 + 7a) \checkmark
 \end{aligned}$$

Instructions:

- Allocate marks as indicated
- If this step is missing $(xy - 2)(2 + 14a)$ then allocate 3 marks for final answer $2(1 + 7a)(xy - 2)$

Instructions for alternative answer:

- Allocate marks as indicated
- If final answer $(1 + 7a)(2xy - 4)$ then allocate 4 marks

(5)

$$\begin{aligned}
 3.2 \quad & \frac{2x - 6}{8x^2} - \frac{3x + 6}{9x^3} \\
 & = \frac{2(x - 3)}{8x^2} - \frac{3(x + 2)}{9x^3} \\
 & = \frac{(x - 3)}{4x^2} - \frac{(x + 2)}{3x^3} \checkmark \\
 & = \frac{3x(x - 3) - 4(x + 2)}{12x^3} \\
 & = \frac{3x^2 - 9x - 4x - 8}{12x^3} \\
 & = \frac{3x^2 \checkmark - 13x \checkmark - 8 \checkmark}{12x^3 \checkmark}
 \end{aligned}$$

Alternative method:

$$\begin{aligned}
 & \frac{2x - 6}{8x^2} - \frac{3x + 6}{9x^3} \\
 & = \frac{9x(2x - 6) - 8(3x + 6)}{72x^3} \\
 & = \frac{18x^2 - 54x - 24x - 48}{72x^3} \\
 & = \frac{18x^2 \checkmark - 78x \checkmark - 48 \checkmark}{72x^3 \checkmark} \\
 & = \frac{6(3x^2 - 13x - 8)}{72x^3} \\
 & = \frac{3x^2 - 13x - 8}{12x^3} \checkmark
 \end{aligned}$$

Instructions:

- 1 mark for factoring numerators and simplifying each fraction
- 1 mark for LCM - denominator
- 3 marks for simplifying the numerator

Instructions for alternative answer:

- 1 mark for LCM - denominator
- 3 marks for simplifying the numerator
- 1 mark for factoring numerators and simplifying fraction

(5)

$$\begin{aligned}
 3.3 \quad 3.3.1 \quad & 105a^5b^2 = 3 \times 5 \times 7 \times a^5b^2 \checkmark \\
 & 245a^2bc^7 = 5 \times 7^2 \times a^2bc^7 \checkmark \\
 & 21b^5d^3 = 3 \times 7 \times b^5d^3 \checkmark
 \end{aligned}$$

Instructions:

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

3.3.2 $LCM = 3 \times 5 \times 7^2 \times a^5 b^5 c^7$
 $LCM = 735 \checkmark a^5 b^5 c^7 \checkmark$

Instructions:

- 1 mark for 735
- 1 mark for $a^5 b^5 c^7$
- (2 marks for answer only) (2)

3.3.3 $HCF = 7 \times b$
 $HCF = 7b \checkmark$

Instructions:

- 1 mark for $7b$
 - (1 mark for answer only) (1)
- [19]

QUESTION 4

4.1 $-3(x - 2) + 4 = 2(x - 1) - 3$
 $-3x + 6 \checkmark + 4 = 2x - 2 \checkmark - 3$
 $-3x + 10 = 2x - 5$
 $-5x = -15 \checkmark$
 $x = \frac{-15}{-5}$
 $\therefore x = 5 \checkmark$

Instructions:

- Allocate marks as indicated

(4)

4.2 $5p = \frac{3q - 4r}{4}$
 $20p = 3q - 4r \checkmark$
 $4r = 3q - 20p \checkmark$
 $r = \frac{3q - 20p}{4} \checkmark$

Instructions:

- Allocate marks as indicated
- Do not penalise if the subject is on the RH. side $\frac{3q - 20p}{4} =$
 r

(3)

4.3 $r = \frac{3q - 20p}{4}$
 $r = \frac{3(-12) - 20(-2)}{4} \checkmark$
 $r = \frac{-36 + 40}{4}$
 $r = 1 \checkmark$

Instructions:

- 1 mark for substitution
- 1 mark for final answer

(2)

4.4 4.4.1 $v = \frac{s}{t}$
 $v = \frac{36 \text{ m}}{4,5 \text{ s}}$
 $v = 8 \text{ m/s} \checkmark$

Instructions:

- 1 mark for final answer

(1)

4.4.2 $t = \frac{s}{v}$
 $t = \frac{100 \text{ m}}{8 \text{ m/s}} \checkmark$
 $t = 12,5 \text{ s} \checkmark$

Instructions:

- Allocate marks as indicated
- Give 1 mark if v is carried over from QUESTION 4.4.1 but not the correct value. Do not give a second mark for final answer.

(2)

QUESTION 5

- 5.1 5.1.1 $m = \frac{1}{3} \checkmark$ (1)
- 5.1.2 $y = \frac{x}{3} + 1$
 $0 = \frac{x}{3} + 1$
 $-1 = \frac{x}{3}$
 $-3 = x \checkmark$
 $(-3; 0) \checkmark$ (2)
- 5.1.3 $(0; 1) \checkmark$ (1)
- 5.1.4 $m = -4$ and $(5; 0)$
 $y = mx + c$
 $0 = -4(5) + c$
 $0 = -20 + c$
 $20 = c \checkmark$
 $y = -4x + 20 \checkmark$ (2)
- 5.1.5 $(0; 20) \checkmark$ (1)
- 5.2 5.2.1 $a = -3 \checkmark$ (1)
- 5.2.2 Quadrants 2 and 4 $\checkmark$ Half mark each (1)
- 5.2.3 $y = \frac{12}{x} \checkmark$ (1)
- 5.2.4 Quadrants 1 and 3 $\checkmark$ (1)
- [11]

QUESTION 6

6.1 6.1.1

$$\begin{aligned}\frac{XY}{PQ} &= \frac{YZ}{QR} \\ \frac{x+6}{12} \checkmark &= \frac{24}{10} \checkmark \\ 10(x+6) &= 24(12) \\ 10x+60 &= 288 \\ 10x &= 288-60 \\ 10x &= 228 \checkmark \\ x &= \frac{228}{10} \\ x &= 22,8 \text{ m} \checkmark\end{aligned}$$

Alternative method:

$$\begin{aligned}\frac{PQ}{XY} &= \frac{QR}{YZ} \\ \frac{12}{x+6} \checkmark &= \frac{10}{24} \checkmark \\ 24(12) &= 10(x+6) \\ 288 &= 10x+60 \\ 288-60 &= 10x \\ 228 &= 10x \checkmark \\ \frac{228}{10} &= x \\ x &= 22,8 \text{ m} \checkmark\end{aligned}$$

6.1.2

$$\begin{aligned}\frac{XZ}{PR} &= \frac{XY}{PQ} \\ \frac{(22,8-2)}{PR} &= \frac{(22,8+6)}{12} \\ \frac{20,8}{PR} \checkmark &= \frac{28,8}{12} \checkmark \\ PR(28,8) &= 20,8(12) \\ 28,8 PR &= 249,6 \checkmark \\ PR &= \frac{249,6}{28,8} \\ PR &= 8,667 \text{ m} \checkmark\end{aligned}$$

Alternative method :

$$\begin{aligned}\frac{PR}{XZ} &= \frac{PQ}{XY} \\ \frac{PR}{20,8} \checkmark &= \frac{12}{28,8} \checkmark \\ PR &= \frac{12}{28,8} \times 20,8 \checkmark \\ PR &= 8,667 \text{ m} \checkmark\end{aligned}$$

Instructions:

- 1 mark for LH. side $\frac{x+6}{12}$
- 1 mark for RH. side $\frac{24}{10}$
- 1 mark for simplifying like terms
- 1 mark for final answer
- (2 marks for answer only)
- Do not penalise if the unit is not indicated

Instructions for alternative answer:

- 1 mark for LH. side $\frac{12}{x+6}$
- 1 mark for RH. side $\frac{10}{24}$
- 1 mark for simplifying like terms
- 1 mark for final answer
- (2 marks for answer only)
- Do not penalise if the unit is not indicated

(4)

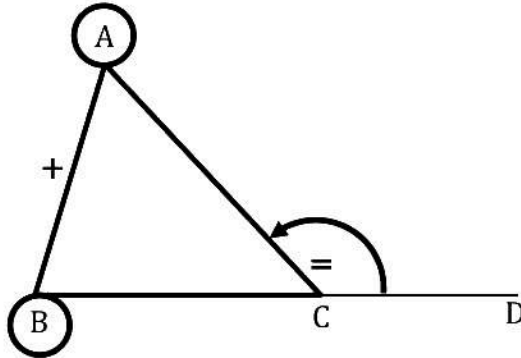
Instructions:

- 1 mark for LH. side $\frac{20,8}{PR}$
- 1 mark for RH. side $\frac{28,8}{12}$
- 1 mark for simplifying like terms
- 1 mark for final answer
- (2 marks for answer only)
- Do not penalise if the unit is not indicated

Instructions for alternative answer:

- 1 mark for LH. side $\frac{PR}{20,8}$
- 1 mark for RH. side $\frac{12}{28,8}$
- 1 mark for simplifying like terms
- 1 mark for final answer
- (2 marks for answer only)
- Do not penalise if the unit is not indicated

- 6.2 The Exterior Angle Theorem states that the measure of an **exterior angle of a triangle is equal to the sum of the two opposite interior angles** (the two non-adjacent interior angles). ✓



$$\hat{ACD} = \hat{A} + \hat{B} \checkmark$$

Instructions:

- 1 mark for written explanation
- 1 mark for diagram
- 1 mark for equation

(3)
[11]

QUESTION 7

7.1 $\tan \theta \checkmark = \frac{2}{11} \checkmark$
 $\theta = \tan^{-1}\left(\frac{2}{11}\right)$
 $\theta = 10,305^\circ \checkmark$

Instructions:

- 1 mark for $\tan \theta$
- 1 mark for $\frac{2}{11}$
- 1 mark for final answer correctly rounded off to 3 decimal places
- Do not penalise if the unit is not indicated

(3)

7.2 $\sin 90^\circ \times \cos 30^\circ \times \tan 60^\circ$
 $= 1 \times \frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{1} \checkmark$
 $= \frac{3}{2} \checkmark$

Instructions:

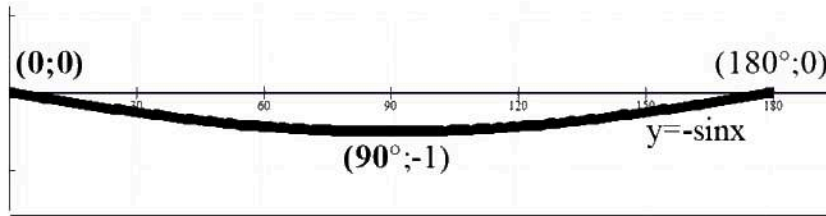
- 1 mark for substitution of trigonometric fraction derived from special angles.
- 1 mark for final answer as a normal fraction, do not give 1 mark for final answer if a decimal number.

(2)

7.3

Instructions:

- 1 mark for each coordinate indicated up to 180°
- 1 mark for equation



(4)
[9]

QUESTION 8

8.1

8.1.1

Area of rugby field:

$$A = l \times b$$

$$A = (x + 40)(x) \checkmark$$

$$A = x^2 + 40x \checkmark$$

Area of soccer field:

$$A = l \times b$$

$$A = (2x)(x - 10) \checkmark$$

$$A = 2x^2 - 20x \checkmark$$

Instructions:

- Allocate marks as indicated
- Do not penalise if calculation is not shown
- (4 marks for answers only)

(4)

8.1.2

Area of rugby field:

$$A = x^2 + 40x$$

$$A = (50)^2 + 40(50)$$

$$A = 4\,500 \text{ m}^2 \checkmark$$

Area of soccer field:

$$A = 2x^2 - 20x$$

$$A = 2(50)^2 - 20(50)$$

$$A = 4\,000 \text{ m}^2 \checkmark$$

Instructions:

- Allocate marks as indicated
- (2 marks for answers only)
- Do not penalise if the unit is not indicated

(2)

8.1.3

The rugby field is larger $\checkmark$

$$\text{by } (4\,500 - 4\,000) = 500 \text{ m}^2 \checkmark$$

Instructions:

- 1 mark for rugby field
- 1 mark for 500 m^2
- Do not penalise if the unit is not indicated

(2)

$$\begin{aligned} 8.2 \quad &= 48 \times \frac{62,5}{100} \checkmark \\ &= 30 \text{ matches } \checkmark \end{aligned}$$

Instructions:

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

$$\begin{aligned} 8.3 \quad &= \frac{30}{35} \times 100 \\ &= 85,714\% \checkmark \end{aligned}$$

Instructions:

- Do not penalise if the unit is not indicated
- (1 mark for answer only) (1)

[11]

TOTAL: 100