



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

MATHEMATICS N2

28 July 2026

This marking guideline consists of 7 pages.

QUESTION 1

$$\begin{aligned}
 1.1 \quad 1.1.1 \quad S &= 2\pi rh + 2\pi r^2 \\
 \Rightarrow S - 2\pi r^2 &= 2\pi rh \quad \checkmark \\
 \Rightarrow r &= \frac{S - 2\pi r^2}{2\pi r} \quad \checkmark
 \end{aligned} \tag{2}$$

$$\begin{aligned}
 1.1.2 \quad h &= \frac{640\pi - 2\pi \times (8)^2}{2\pi \times 8} \quad \checkmark \\
 &= 32 \quad \checkmark
 \end{aligned} \tag{2}$$

$$\begin{aligned}
 1.2 \quad 1.2.1 \quad -p &= 3(2 - p) - 2(p - 1) \\
 \Rightarrow -p &= 6 - 3p - 2p + 2 \quad \checkmark \\
 \Rightarrow 4p &= 8 \\
 \Rightarrow p &= 2 \quad \checkmark
 \end{aligned} \tag{2}$$

$$\begin{aligned}
 1.2.2 \quad 6p^2 + 5p - 21 &= 0 \\
 \Rightarrow (3p + 7)(2p - 3) &= 0 \quad \checkmark \quad \checkmark \\
 \Rightarrow p &= -\frac{7}{3} = 2,333 \quad \checkmark \quad \text{OR} \quad p = \frac{3}{2} = 1,5 \quad \checkmark
 \end{aligned} \tag{4}$$

$$\begin{aligned}
 1.3 \quad \text{Eq. 1: } 6d + 7w &= 825 \\
 \text{Eq. 2: } 6d + 3w &= 525 \\
 \text{Eq. 1} \Rightarrow d &= \frac{825 - 7w}{6} \quad \text{--- Eq. 3} \quad \checkmark \\
 \text{Eq. 3 in Eq. 2} \Rightarrow 6\left(\frac{825 - 7w}{6}\right) + 3w &= 525 \quad \checkmark \quad \text{OR} \\
 \Rightarrow w &= \frac{-300}{-4} = R75 \quad \checkmark \\
 \text{Eq. 3} \Rightarrow d &= \frac{825 - 7(75)}{6} = R50 \quad \checkmark
 \end{aligned}$$

$$\begin{aligned}
 \text{Eq. 1: } 6d + 7w &= 825 \\
 \text{Eq. 2: } 6d + 3w &= 525 \\
 \text{Eq. 1} - \text{Eq. 2} \Rightarrow 4w &= 300 \quad \checkmark \\
 \Rightarrow w &= R75 \quad \checkmark \\
 \text{Eq. 1} \Rightarrow 6d + 7(75) &= 825 \quad \checkmark \\
 \Rightarrow d &= \frac{300}{6} = R50 \quad \checkmark
 \end{aligned}$$

Note: Accept any other method that leads to correct answers. (4)
[14]

QUESTION 2

$$\begin{aligned}
 2.1 \quad 2.1.1 \quad 6q^2 - 30q + 36 &= 6(q - 3)(q - 2) \quad \checkmark \checkmark \checkmark \\
 6q^2 - 54 &= 6(q + 3)(q - 3) \quad \checkmark \checkmark \checkmark
 \end{aligned} \tag{6}$$

$$2.1.2 \quad \text{HCF} = 6(q - 3) \quad \checkmark \quad \text{and} \quad \text{LCM} = 6(q - 3)(q + 3)(q - 2) \quad \checkmark \tag{2}$$

$$\begin{aligned}
 2.2 \quad 2.2.1 \quad & \frac{4y}{y^2 - 16} - \frac{3}{y - 4} \\
 &= \frac{4y}{(y - 4)(y + 4)\checkmark} - \frac{3}{y - 4} \\
 &= \frac{4y - 3(y + 4)\checkmark}{(y - 4)(y + 4)\checkmark} \\
 &= \frac{4y - 3y - 12\checkmark}{(y - 4)(y + 4)} \\
 &= \frac{y - 12\checkmark}{(y - 4)(y + 4)}
 \end{aligned} \tag{5}$$

$$\begin{aligned}
 2.2.2 \quad & \frac{2x^2 + x - 3}{3xy - 3y} \times \frac{3y^2 - 6xy + 3x^2}{4x + 6} \div \frac{y^2 - 2xy + x^2}{y^2 - xy} \\
 &= \frac{(x - 1)(2x + 3)\checkmark}{3y(x - 1)\checkmark} \times \frac{3(y - x)(y - x)\checkmark}{2(2x + 3)\checkmark} \times \frac{y(y - x)\checkmark}{(y - x)(y - x)\checkmark} \\
 &= \frac{y - x}{2} \checkmark
 \end{aligned} \tag{7}$$

[20]

QUESTION 3

$$\begin{aligned}
 3.1 \quad 3.1.1 \quad & \log 6 = \log(2 \times 3) \checkmark \\
 &= \log 2 + \log 3 \checkmark \\
 &= a + b \checkmark
 \end{aligned} \tag{3}$$

$$\begin{aligned}
 3.1.2 \quad & \log 36 = \log 6^2 \checkmark \\
 &= 2\log(2 \times 3) \checkmark \\
 &= 2(\log 2 + \log 3) \checkmark \quad \text{OR} \\
 &= 2(a + b) \checkmark
 \end{aligned}$$

$$\begin{aligned}
 \log 36 &= \log(3^2 \times 2^2) \checkmark \\
 &= \log 3^2 + \log 2^2 \checkmark \\
 &= 2\log 3 + 2\log 2 \checkmark \\
 &= 2a + 2b \checkmark
 \end{aligned}$$

(4)

$$\begin{aligned}
 3.2 \quad 3.2.1 \quad & \log 10x - \log(x - 9) = 2 \\
 &\Rightarrow \log\left(\frac{10x}{x - 9}\right) = 2 \checkmark \\
 &\Rightarrow \frac{10x}{x - 9} = 10^2 = 100 \checkmark \\
 &\Rightarrow 10x = 100(x - 9) \\
 &\Rightarrow 10x = 100x - 900 \checkmark \\
 &\Rightarrow -90x = -900 \\
 &\Rightarrow x = 10 \checkmark
 \end{aligned}$$

$$\begin{aligned}
 3.2.2 \quad & 3\left(\frac{1}{27}\right)^{4x-2} = \frac{4}{36} \\
 \Rightarrow & 3(3^{-3})^{4x-2} = \frac{1}{9} \checkmark \\
 \Rightarrow & 3^{1-12x+6} = 3^{-2} \checkmark \\
 \Rightarrow & 7-12x = -2 \checkmark \\
 \Rightarrow & x = \frac{-9}{-12} = \frac{3}{4} = 0,75 \checkmark
 \end{aligned}$$

$$\begin{aligned}
 & 3\left(\frac{1}{27}\right)^{4x-2} = \frac{4}{36} \\
 \Rightarrow & \left(\frac{1}{27}\right)^{4x-2} = \frac{1}{27} \checkmark \\
 \Rightarrow & 4x-2 = 1 \checkmark \\
 \Rightarrow & 4x = 3 \checkmark \\
 \Rightarrow & x = \frac{3}{4} = 0,75 \checkmark
 \end{aligned}$$

(4)
[15]

QUESTION 4

$$\begin{aligned}
 4.1 \quad 4.1.1 \quad & \text{Volume} = \pi r^2 h \\
 \Rightarrow & 270\pi = \pi r^2 \times 30 \\
 \Rightarrow & r^2 = \frac{270\pi}{30\pi} \checkmark \\
 \Rightarrow & r = 3 \text{ cm} \checkmark
 \end{aligned}$$

$$\begin{aligned}
 4.1.2 \quad & \text{Surface Area} = 2\pi r^2 + 2\pi rh \\
 & = 2\pi(3)^2 + 2\pi(3)(30) \checkmark \\
 & = 198\pi \text{ cm}^2 \text{ OR } 622,035 \text{ cm}^2 \checkmark
 \end{aligned}$$

(2 × 2) (4)

$$\begin{aligned}
 4.2 \quad 4.2.1 \quad & V_c = V_s = \frac{1}{3}\pi r^2 h \\
 & = \frac{1}{3}\pi(25)^2(15) \checkmark \\
 & = 3125\pi \text{ mm}^3 \text{ OR } 9817,477 \text{ mm}^3 \checkmark
 \end{aligned}$$

$$\begin{aligned}
 4.2.2 \quad & \text{Volume} = \frac{4}{3}\pi r^3 \\
 \Rightarrow & 3125\pi = \frac{4}{3}\pi r^3 \\
 \Rightarrow & r^3 = \frac{9375\pi}{4\pi} \checkmark \\
 \Rightarrow & r = 13,283 \text{ mm} \checkmark
 \end{aligned}$$

(2 × 2) (4)

4.3

$$\text{Area} = \left[\frac{\text{First ordinate} + \text{Last ordinate}}{2} + \text{sum of all other ordinates} \right] \times \text{distance}$$

$$15450 \checkmark = \left[\frac{110 + 108 \checkmark}{2} + 127 + 138 + 137 + 144 + 132 + 126 + 118 \right] d$$

$$\Rightarrow 15450 = 1031d \checkmark$$

$$\Rightarrow d = 14,985 = 15 \checkmark$$

(4)
[12]

QUESTION 5

5.1 5.1.1 $x^2 + 14x + 24 = 0 \checkmark$

$$\Rightarrow x = \frac{-14 \pm \sqrt{(14)^2 - 4(1)(24)}}{2(1)}$$

$$\Rightarrow x = -2 \text{ OR } x = -12 \checkmark$$

$$\therefore A(-12; 0) \checkmark \text{ and } B(-2; 0) \checkmark$$

(4)

5.1.2 $y = -2 \checkmark$ for $g(x)$ and $y = 24 \checkmark$ for $f(x)$

$$\therefore FD = 24 - (-2) = 26 \checkmark$$

(3)

5.1.3 $x = -\frac{14}{2(1)} = -7 \checkmark$ and $y = (-7)^2 + 14(-7) + 24 = -25 \checkmark$

$$\therefore E(-7; -25) \checkmark$$

(3)

5.1.4 $x = -12 \checkmark$

(1)

5.1.5 $y = -2 - (-12) = 10 \checkmark$

$$\therefore C(-12; 10) \checkmark$$

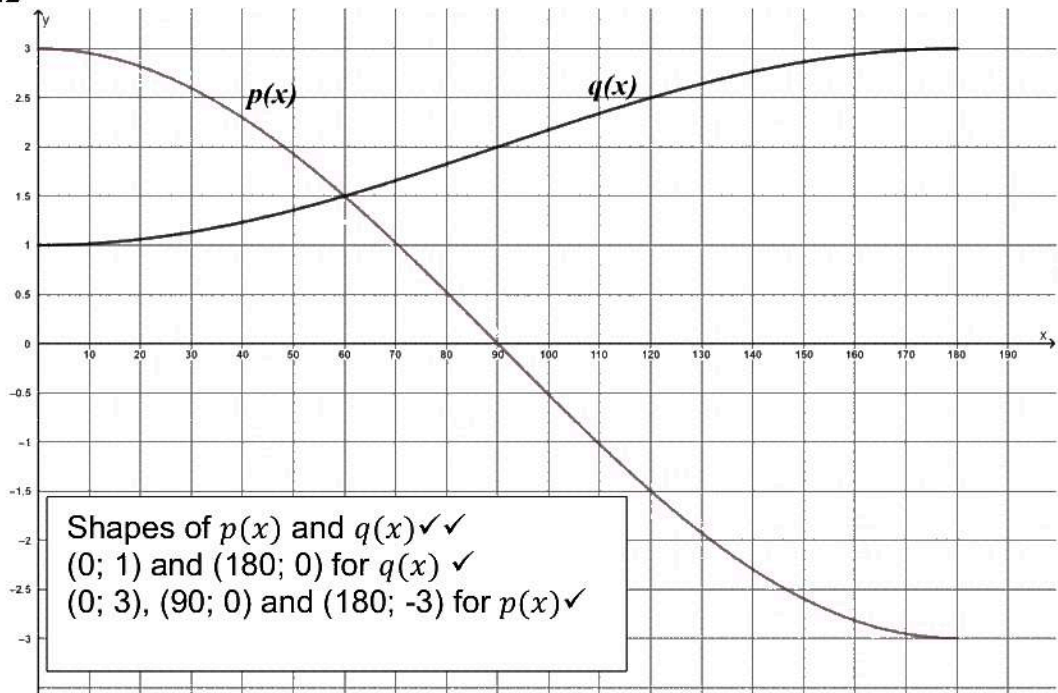
(2)

5.2 5.2.1

x	0	30	60	90	120	150	180
$p(x)$	3	2,6	1,5	0	-1,5	- 2,6	-3
$q(x)$	1	1,1	1,5	2	2,5	2,9	3

(1)

5.2.2



(4)

5.2.3

$x = 60^\circ$ ✓ and $y = 1,5$ ✓

NOTE: Accept accuracy of ± 1 for x values and $\pm 0,1$ for y values

(2)

[20]

QUESTION 6

6.1

$$6,051 \text{ rads} = \frac{6,051 \times 180^\circ}{\pi} = 346,697^\circ \quad \checkmark$$

OR

$$6,051 \text{ rads} = 6,051 \times 57,3^\circ = 346,722^\circ \quad \checkmark$$

(1)

6.2

$$6.2.1 \quad \theta = 52,3^\circ = \frac{52,3 \times \pi}{180^\circ} = 0,913 \text{ rads} \quad \checkmark$$

OR

$$\theta = 52,3^\circ = \frac{52,3}{57,3} = 0,913 \text{ rads} \quad \checkmark$$

(1)

6.2.2

$$\begin{aligned} \text{Area} &= \frac{1}{2} r^2 \theta \\ &= \frac{1}{2} (24)^2 \times (0,913) \quad \checkmark \quad \text{OR} \\ &= 262,944 \text{ m}^2 \quad \checkmark \end{aligned}$$

$$\begin{aligned} \text{Area} &= \frac{1}{2} \left(\frac{d}{2} \right)^2 \theta \\ &= \frac{1}{2} \left(\frac{48}{2} \right)^2 \times (0,913) \quad \checkmark \\ &= 262,944 \text{ m}^2 \quad \checkmark \end{aligned}$$

(2)

6.2.3 $l = \frac{d}{2} \theta$

$$= \frac{48}{2} \times (0,913) \checkmark \quad \text{OR}$$

$$= 27,912 \text{ m } \checkmark$$

$l = r\theta$
 $= 24 \times (0,913) \checkmark$
 $= 27,912 \text{ m } \checkmark$

(2)

6.3 6.3.1 $V = 120 \text{ km/h} = \frac{120 \times 1000}{60 \times 60} = \frac{100}{3} \text{ m/s } \checkmark$

$$V = \pi D n \Rightarrow \frac{100}{3} = 4\pi n$$

$$\Rightarrow n = \frac{100}{12\pi} = 2,653 \text{ revs per sec. } \checkmark$$

$$\Rightarrow n = \frac{100}{12\pi} \times 60 = \frac{500}{\pi} = 159,155 \text{ revs per minutes. } \checkmark$$

(3)

6.3.2 $V = \omega R$

$$\Rightarrow \frac{100}{3} = 2\omega \checkmark$$

$$\Rightarrow \omega = \frac{100}{6} \text{ rads/sec OR } 16,667 \text{ rads/sec OR } \frac{50}{3} \text{ rads/sec } \checkmark$$

(2)

6.4 $D = \frac{x^2}{4h} + h$

$$\Rightarrow 440 = \frac{x^2}{4(40)} + 40 \checkmark$$

$$\Rightarrow x^2 = 64000 \checkmark$$

$$\Rightarrow x = 80\sqrt{10} \text{ mm OR } x = 252,982 \text{ mm } \checkmark$$

(3)

6.5 6.5.1 $\sin A = \frac{60}{71,111} = 0,844 \checkmark$

6.5.2 $\cos C = \frac{60}{71,111} = 0,843 \checkmark$

6.5.3 $\tan A = \frac{60}{40} = \frac{6}{4} = \frac{3}{2} = 1,5 \checkmark$

6.5.4 $\operatorname{cosec} A = \frac{71,111}{60} = 1,185 \checkmark$

6.5.5 $\sec C = \frac{71,111}{40} = 1,778 \checkmark$

(5 × 1) (5)
[19]

TOTAL: