



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

AUGUST EXAMINATION

MATHEMATICS N1

1 AUGUST 2016

This marking guideline consists of 7 pages.

QUESTION 1

1.1 1.1.1
$$\frac{2a^4 b^{3^2}}{4a^2 b^{2^3}}$$

$$\frac{2^2 a^8 b^6}{4^3 a^6 b^6} \checkmark$$

$$4^2 a^2 b^0 \checkmark$$

$$\frac{1}{4^2} a^2 \checkmark$$

$$\frac{1}{16} a^2 \checkmark$$
 (4)

1.1.2
$$\sqrt[4]{\frac{81a^6}{16a^2}} \quad 4a^{-2^0}$$

$$\frac{3^{\frac{1}{4}} a^{\frac{6}{4}}}{2^4 a^{\frac{2}{4}}} \quad 1 \checkmark \checkmark$$

$$\frac{3^{\frac{1}{4}} a^{1.5}}{2} \quad 1 \checkmark \checkmark$$

$$\frac{3a}{2} \quad 1$$

$$\frac{3a}{2} \checkmark$$
 (5)

1.1.3 $\log_2 80 \log_2 5 \log_2 32$

$$\log_2 \frac{80}{5} \log_2 2 \checkmark$$

$$\log_2 16 \quad 5 \log_2 2 \checkmark$$

$$4 \log_2 2 \quad 5 \log_2 2 \checkmark$$

$$4(1) \quad 5(1)$$

$$9 \checkmark$$
 (4)

1.2 $x = \frac{6,4}{\sqrt{0,79}}$

$$\log x = \log \frac{6,4}{\sqrt{0,79}} \checkmark$$

$$\log 6,4 - \frac{1}{2} \log 0,79 \checkmark$$

$$0,806 - \frac{1}{2} 0,102 \checkmark$$

$$0,806 - 0,051 \checkmark$$

$$\log x = 0,857 \checkmark$$

$$x = 7,194 \checkmark$$
 (6)

1.3

$$\begin{array}{r}
 x^2 \quad 2x \quad 4 \quad \checkmark \checkmark \checkmark \\
 \hline
 x^3 \quad 0x^2 \quad 0x \quad 8 \\
 x^3 \quad 2x^2 \quad \checkmark \\
 \hline
 2x^2 \quad 0x \quad 8 \\
 \underline{2x^2 \quad 4x \quad \checkmark} \\
 4x \quad 8 \\
 \underline{4x \quad 8 \quad \checkmark} \\
 0 \\
 (x^2 - 2x + 4)(x - 2)
 \end{array}$$

(6)
[25]

QUESTION 2

2.1 2.1.1 $70x^3y^4z^5 - 257x^3y^4z^5 \checkmark$

$$\begin{array}{r}
 49x^2y^3z^4 - 77x^2y^3z^4 \checkmark \\
 98xy^2z^3 - 277xy^2z^3 \checkmark
 \end{array}$$

(3)

2.1.2 $2577x^3y^4z^5 - 490x^3y^4z^5 \checkmark \checkmark$ (2)

2.1.3 $7xy^2z^3 \checkmark \checkmark$ (2)

2.2 2.2.1 $9x^3y^2 - 18x^2y - 3x^2y^3 + 3x^2y(3xy - 6y^2) \checkmark \checkmark \checkmark \checkmark$

2.2.2 $3x - 12y - xt + 4yt + 3x - 12y - xt + 4yt \checkmark + 3x - 4y - tx + 4y \checkmark + 3 - tx + 4y \checkmark \checkmark$ (2 × 4) (8)

2.3 2.3.1 $\frac{8x^2 - 8xy}{20x^2} - \frac{4xy - 4y^2}{30x^2y} = \frac{8xx - y}{20x^2} - \frac{30x^2y}{4yx - y} \checkmark \checkmark$

$$\frac{6x}{2} \checkmark$$

(4)

2.3.2 $\frac{14x - 21x^2 - 28x^3}{7x} = \frac{14x - 21x^2 - 28x^3}{7x}$ alternative

$$\frac{7x - 23x - 4x^2}{7x} \checkmark \quad \frac{14x}{7x} - \frac{21x^2}{7x} - \frac{28x^3}{7x} \checkmark$$

2 $3x$ $4x^2$ ✓ ✓

2 $3x$ $4x^2$ ✓✓

(3)
[22]

QUESTION 3

3.1

$$\frac{y}{3} \quad y \quad 2 \quad 6$$

$$y \quad 3y \quad 6 \quad 18 \quad \checkmark$$

$$4y \quad 18 \quad 6 \quad \checkmark$$

$$4y \quad 24 \quad \checkmark$$

$$y \quad 6 \quad \checkmark$$

(4)

3.2

3.2.1

$$T = \frac{pv^2}{g}$$

$$gT = pv^2 \quad \checkmark$$

$$\frac{gT}{p} = v^2 \quad \checkmark$$

$$v = \sqrt{\frac{gT}{p}} \quad \checkmark$$

(3)

3.2.2

$$v = \sqrt{\frac{gT}{p}}$$

$$v = \sqrt{\frac{14 \cdot 20}{12}} \quad \checkmark$$

$$4,830 \quad \checkmark$$

(2)

3.3

$$V = 2rN$$

$$2(19) = 50 \quad \checkmark$$

$$5969,03 \text{ mm/m} \quad \checkmark$$

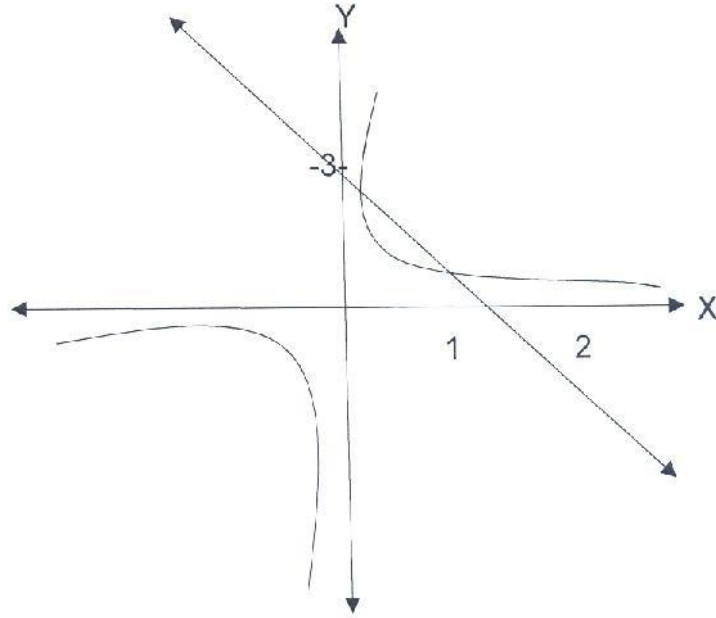
$$0,099 \text{ m/s} \quad \checkmark$$

(3)
[12]

QUESTION 4

$y = 2x - 3$ and $xy = 3$
 $[-2 < x \leq 3]$

Give 2 marks for straight line, 2 marks for hyperbola and 2 marks for x and y.



x	-2	-1	0	1	2	3
$y = 2x - 3$	$7\sqrt{}$	$5\sqrt{}$	$3\sqrt{}$	$1\sqrt{}$	$-1\sqrt{}$	$-3\sqrt{}$
$xy = 3$	$-1,5\sqrt{}$	$-3\sqrt{}$	undefined $\sqrt{}$	$3\sqrt{}$	$1,5\sqrt{}$	$1\sqrt{}$

[12]

QUESTION 5

5.1 5.1.1 *In* $\triangle ACB$ and $\triangle ADC$

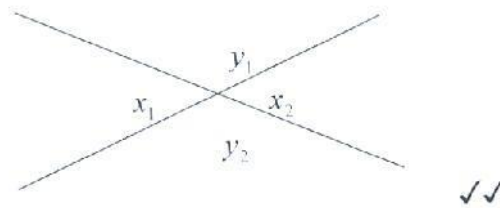
$$\begin{array}{l} \triangle ACB \cong \triangle ADC \\ \frac{AC}{CB} = \frac{AD}{DC} \\ \frac{19}{18} = \frac{y}{13} \checkmark \\ y = \frac{19 \cdot 13}{18} \checkmark \\ y = 13,72 \checkmark \end{array}$$

5.1.2 $\frac{AC}{CB} = \frac{CD}{DB}$

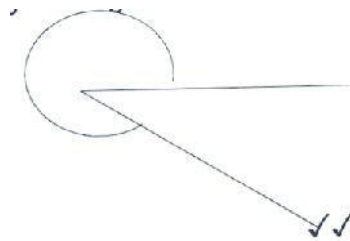
$$\begin{array}{l} \frac{19}{18} = \frac{15}{x} \checkmark \\ 19x = 15 \cdot 18 \checkmark \\ x = 14,21 \checkmark \end{array}$$

(2 × 3) (6)

5.2 5.2.1



5.2.2 Reflex angle is greater than 180° and smaller than 360°



(2 × 2) (4)

5.3 $\frac{1}{\sqrt{2}} \checkmark$

(1)

$$5.4 \quad 6 \sin 45^\circ \cdot 2 \cos 60^\circ \cdot \sin 60^\circ$$

$$6 \cdot \frac{1}{\sqrt{2}} \cdot 2 \cdot \frac{1}{2} \cdot \frac{3}{2} \sqrt{\sqrt{3}}$$

$$6 \cdot \frac{1}{2} \cdot \frac{2}{2} \cdot \frac{3}{2} \sqrt{4}$$

$$4 \cdot \frac{3}{4} \sqrt{4}$$

$$\frac{13}{4} \sqrt{4}$$

$$3 \cdot \frac{1}{4}$$

(5)
[16]**QUESTION 6**

$$6.1 \quad V_{\text{sphere}} = \frac{4}{3} r^3$$

$$\frac{4}{3} 12^3 \checkmark \checkmark$$

$$7238,229 \text{ cm}^3 \checkmark \checkmark$$

(4)

$$6.2 \quad \text{surface area}_{\text{cylinder}} = 2rh + r^2 \checkmark$$

$$2(7)22 + 7^2 \checkmark$$

$$1121,549 \text{ cm}^2 \checkmark$$

(3)

$$6.3 \quad R925,75 + R74,25 = R1\,000$$

$$\frac{74,25}{1\,000} \cdot 100 \checkmark$$

$$= 7,425$$

$$= 7,43\% \checkmark$$

(2)

$$6.4 \quad \frac{25}{100} R6\,800 = R1\,700,00 \checkmark$$

$$R6\,800 - R1\,700 = R5\,100,00 \checkmark$$

$$\frac{15}{100} R5\,100 = R765,00 \checkmark$$

$$R5\,100 - R765,00 = R4\,335,00 \checkmark$$

(4)

[13]

TOTAL: 100

