higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

APRIL EXAMINATION

MATHEMATICS N1

1 APRIL 2016

This marking guideline consists of 8 pages.

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QUESTION 1

1.1 1✓

1.2 $\frac{x}{y}$ ✓

1.3 10✓

1.4 66,667✓

1.5 R1,30 ✓

1.6 -5✓

1.7 Hypotenuse✓

1.8 $\frac{\Delta y}{\Delta x}$ ✓

1.9 Isosceles✓

1.10 4✓

(10 x 1) **[10]**

QUESTION 2

2.1 2.1.1

$$\left(a^3\right)^{b-c} \times \left(a^4\right)^{b+c}$$
$$= a^{3b-3c} \times a^{4b+4c} \checkmark$$
$$= a^{3b+4b-3c+4c} \checkmark$$
$$= a^{7b+c} \checkmark$$ (3)

2.1.2

$$\left[\left(\frac{1}{2}\right)^2\right]^{-3}$$
$$= \left[\frac{1}{4}\right]^{-3} \checkmark$$
$$= \left[\frac{4}{1}\right]^{3} \checkmark$$
$$= 4^3$$
$$= 64 \checkmark$$ (3)

2.1.3 $2ab^0 \times \sqrt[3]{\dfrac{27a^3b^4}{729b}}$

$= 2a(1) \times \left(\dfrac{3^3a^3b^4}{3^6b}\right)^{\frac{1}{3}}$ ✓

$= 2a \times \left(3^{3-6}a^3b^{4-1}\right)^{\frac{1}{3}}$ ✓

$= 2a \times \left(3^3a^3b^3\right)^{\frac{1}{3}}$ ✓

$= 2a \times 3ab$

$6a^2b$ ✓ (4)

2.2 $x = \dfrac{0{,}48 \times 133}{0{,}12}$

$\therefore \log x = \log\left(\dfrac{0{,}48 \times 133}{0{,}12}\right)$ ✓

$= \log 0{,}48 + \log 133 - \log 0{,}12$ ✓

$= -0{,}319 + 2{,}124 - (-0{,}921)$ ✓

$= 0{,}319 + 2{,}124 + 0{,}921$ ✓

$\log x = 3{,}364$ ✓

$x = 2312{,}065$ ✓ (6)

2.3
$$\begin{array}{l} 16x^2y + 4xy^2 - 7xy \\ -10x^2y + 6xy^2 - 4xy \\ \hline 6x^2y + 10xy^2 - 11xy \end{array}$$ ✓✓✓ (3)

2.4 $8x - [x + 3(-x - 2)]$

$= 8x - [x - 3x - 6]$ ✓

$= 8x - x + 3x + 6$ ✓

$= 10x + 6$ ✓

$2(5x + 3)$ ✓ (4)

[23]

QUESTION 3

3.1

$$\begin{array}{r|l} & 6x^2-12x+17 \checkmark\checkmark\checkmark \\ \hline x+2 & 6x^3+0x^2-7x+6 \\ & 6x^3+12x^2 \quad \checkmark \\ & \underline{\quad} \\ & -12x^2-7x+6 \\ & -12x^2-24x \quad \checkmark \\ & \underline{\quad} \\ & 17x+6 \\ & 17x+34 \quad \checkmark \\ & \underline{\quad} \\ & -28 \checkmark \end{array}$$

$(x+2)(6x^2-12x+17)$ remainder -28 (7)

3.2 3.2.1

$32x^3y^4z^2 = 2^5x^3y^4z^2 \checkmark$
$48x^5y^3z^3 = 2^4 \times 3x^5y^3z^3 \checkmark$
$70x^2y^5z^4\ 2 \times 5 \times 7x^2y^5z^4 \checkmark$ (3)

3.2.2

$= 2^5 \times 3 \times 5 \times 7x^5y^5z^4$
$= 3360x^5y^5z^4 \checkmark\checkmark$ (2)

3.2.3

$2x^2y^3z^2 \checkmark\checkmark$ (2)

3.3 3.3.1

$ab - 8xy + 2bx - 4ay$
$= (ab + 2bx) + (-4ay - 8xy)$ ✓
$= b(a + 2x) - 4y(a + 2x)$ ✓✓
$= (b - 4y(a + 2x))$ ✓✓ (5)

3.3.2

$\frac{1}{2}x^2 - \frac{1}{4}xy + \frac{1}{4}x^2y^2$
$= \frac{1}{4}x(2x - y + xy^2)$ ✓✓✓✓ ONE mark each term (4)

3.4

$\frac{24x^2-4x}{5x} \div \frac{30x-5}{3x}$
$= \frac{4x(6x-1)}{5x} \times \frac{3x}{5(6x-1)}$ ✓✓ ONE mark for multiplication sign, factorise
$= \frac{4x}{5} \times \frac{3}{5}$ ✓
$= \frac{12x}{25}$ ✓ (4)

[27]

QUESTION 4

4.1 $4(y-3)-6y=2(y+4)$
$4y-12-6y=2y+8$ ✓✓
$-2y-12=2y+8$ ✓
$-2y-2y=8+12$ ✓
$\frac{-4y}{4}=\frac{20}{4}$
$\therefore y=-5$ ✓ (5)

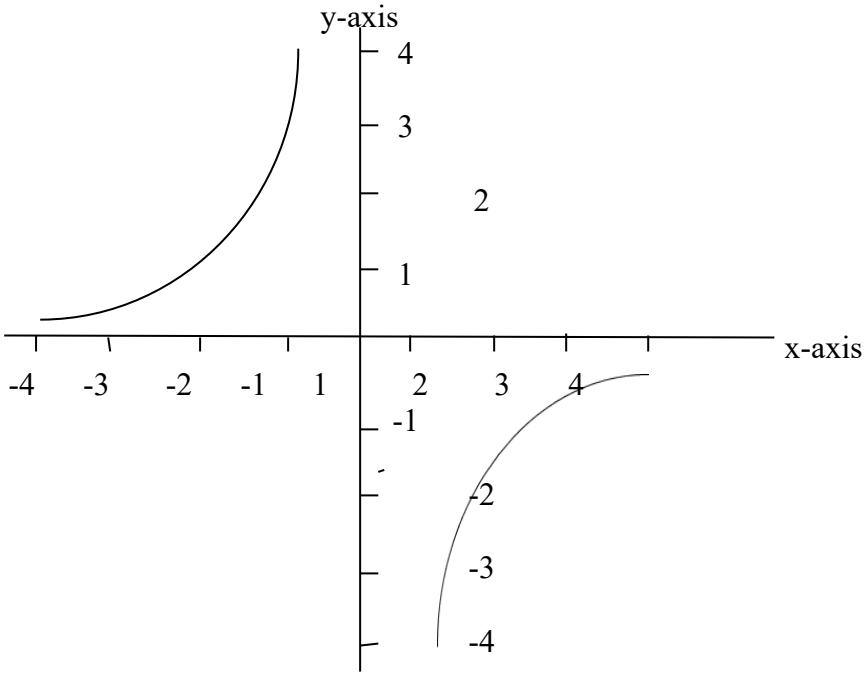
4.2 $4x-4=24$ ✓✓
$4x=24+4$ ✓
$4x=28$
$\therefore x=7$ ✓ (4)

4.3 $p=\frac{1}{3}gt^2$
$3p=gt^2$ ✓
$\frac{3p}{g}=t^2$ ✓
$\therefore t=\sqrt{\frac{3p}{g}}$ ✓
(3)
[12]

QUESTION 5

5.1

x	-4	-3	-2	-1	0	1	2	3	4
y	1	1,33	2	4	∞	-4	-2	-1,33	-1



Scale: 1 cm = 1 unit ONE mark for correct scale in both axis
One mark for indicating y-axis and x-axis (8)

5.2 Rectangular hyperbola✓ (1)

5.3 No y-intercept✓ (1)

5.4 2 and 4✓ (1)
[11]

QUESTION 6

6.1 $4x + 6x + 2x = 180^0$ ✓

$\frac{12x}{12} = \frac{180^0}{12}$ ✓

$x = 15$ ✓

6.2 $80^0 + x + x = 180^0$ ✓

$2x = 180^0 - 80^0$ ✓

$2x = 100^0$

$x = 50^0$ ✓

6.3 $(20)^2 = 15^2 + x^2$

$\therefore x^2 = (20)^2 - (15)^2$ ✓

$x^2 = 400 - 225$ ✓

$x = \sqrt{175}$

$x = 13{,}229$ ✓

(3 x 3) **[9]**

QUESTION 7

7.1 7.1.1 $2\sin 30^\circ + 3\cos 60^\circ$

$= 2\left(\frac{1}{2}\right) + 3\left(\frac{1}{2}\right)$ ✓

$= 1 + 1\frac{1}{2}$

$= 2\frac{1}{2}$

$= \frac{5}{2}$ ✓ (2)

7.1.2 $4\cos 30^0 (\sin 45^0)(\cos 45^0)$

$= 4\left(\frac{\sqrt{3}}{2}\right)\left(\frac{1}{\sqrt{2}}\right)\left(\frac{1}{\sqrt{2}}\right)$ ✓

$= 2\left(\frac{\sqrt{3}}{1}\right)\left(\frac{1}{2}\right)$

$= \sqrt{3}$ ✓ (2)

7.2 Perimeter = 4L

= 4(6 cm) ✓

=24 cm✓ (2)

7.3 $V = L \times b \times h$
$= 200 \times 125 \times 90$✓
$= 2\ 250\ 000\ m^3$
$= 2\ 250\ cm^3$ ✓ (2)
[8]

TOTAL: 100

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