higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

NOVEMBER EXAMINATION

MATHEMATICS N1

21 NOVEMBER 2016

This marking guideline consists of 7 pages.

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QUESTION 1

1.1 1.1.1 3
1.1.2 -2
1.1.3 x
1.1.4 7
1.1.5 Constant

(5 × 1) (5)

1.2 1.2.1 243✓ (1)
1.2.2 3✓ (1)
1.2.3 5✓ (1)
1.2.4 $3^5 = 243$✓✓ (2)
[10]

QUESTION 2

2.1 2.1.1

$$-6(a^0b^2)^3 \times \sqrt[5]{\frac{32b^{15}}{b^5}}$$

$$= -6(b^6) \times \left(\frac{2^5b^{15}}{b^5}\right)^{\frac{1}{5}} \checkmark\checkmark$$

$$= -6b^6 \times \frac{2b^3}{b} \checkmark$$

$$= -6b^6 \times 2b^2$$

$$= -12b^8 \checkmark$$ (4)

2.1.2

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

$$= \left[\frac{1}{27}\right]^{-2} \checkmark$$

$$= [27]^2 \checkmark$$

$$= 729 \checkmark$$ (3)

2.2

$$2(x-y) - [2x + 2(x-y)]$$

$$= 2x - 2y - [2x + 2x - 2y] \checkmark$$

$$= 2x - 2y - [4x - 2y] \checkmark$$

$$= 2x - 2y - 4x + 2y \checkmark$$

$$= -2x \checkmark$$ (3)

2.3 $8\log_e \sqrt{e} + \log_2 16 - (\log_{10} 25 + \log_{10} 4)$

$= 8 \bullet \frac{1}{2}\log_e e + 4\log_2 2 - \log_{10}(25 \times 4)$ ✓

$= 4\log_e e + 4\log_2 2 - \log_{10} 100$ ✓

$= 4\log_e e + 4\log_2 2 - 2\log_{10} 10$ ✓

$= 4(1) + 4(1) - 2(1)$

$= 6$ ✓ (4)

2.4 $x = \frac{0{,}38 \times \sqrt{0.47}}{0.55}$

$\log x = \log \frac{0{,}38 \times \sqrt{0{,}47}}{0{,}55}$

$= \log 0{,}38 + \frac{1}{2}\log 0{,}47 - \log 0{,}55$ ✓

$= -0{,}420 + (-0{,}164) - (-0{,}259)$ ✓

$\log x = -0{,}325$ ✓

$x = 0{,}473$ ✓ (4)

[18]

QUESTION 3

3.1

$$\begin{array}{r|l} & x^2 + 2x + 5 \checkmark\checkmark\checkmark \\ \hline x^3 + 0x^2 & + x - 5 \\ \cancel{x - 2x^3} & - 2x^2 \checkmark \\ \hline & 2x^2 + x \\ 2x^2 - 4x \checkmark & \\ \hline 5x - 5 & \\ 5x - 10 \checkmark & \\ \hline 5 \checkmark & \end{array}$$

$\therefore (x-2)(x^2 + 2x + 5)$ remainder 5 (7)

3.2 $87pd - 64bc - 70qr$

$(-) - 68pd + 47bc + 94qr$

$155pd - 111bc - 164qr$ ✓✓✓ (3)

3.3 3.3.1 $24x^3y^4z^2 - 16x^2y^3z - 8xy^2$

$= 8xy^2(3x^2y^2z^2 - 2xyz - 1)$ ✓✓✓✓ (4)

3.3.2 $x^3 - xy - 2x^2 + 2y$

$= (x^3 - 2x^2) + (-xy + 2y)$ ✓✓

$= x^2(x-2) - y(x-2)$ ✓

$= (x^2 - y)(x+2)$ ✓✓ (5)

3.4 $36x^6y^3z^2 = 2\times2\times3\times3x^6y^3z^2$ ✓
$70x^2y^2z = 2\times5\times7x^2y^2z$ ✓
$20x^4yz^3 = 2\times2\times5x^4yz^3$ ✓ (3)

3.4.1 $2\times2\times3\times3\times5\times7x^6y^3z^3$
$1260x^6y^3z^3$ ✓✓ (2)

3.4.2 $2x^2yz$ ✓✓ (2)
[26]

QUESTION 4

4.1 $-4(x-3)-5=3(x-7)$
$=-4x+12-5=3x-21$ ✓✓
$-4x-3x=-21-7$ ✓
$-7x=-28$ ✓
$x=4$ ✓ (5)

4.2 $T=2\pi\sqrt{\frac{p}{g}}$
$\frac{T}{2\pi}=\sqrt{\frac{p}{g}}$ ✓
$\left(\frac{T}{2\pi}\right)^2=\frac{p}{g}$ ✓
$\frac{T^2}{4\pi^2}=\frac{p}{g}$
$4p\pi^2=gT^2$ ✓
$\therefore p=\frac{gT^2}{4\pi^2}$ ✓ (4)

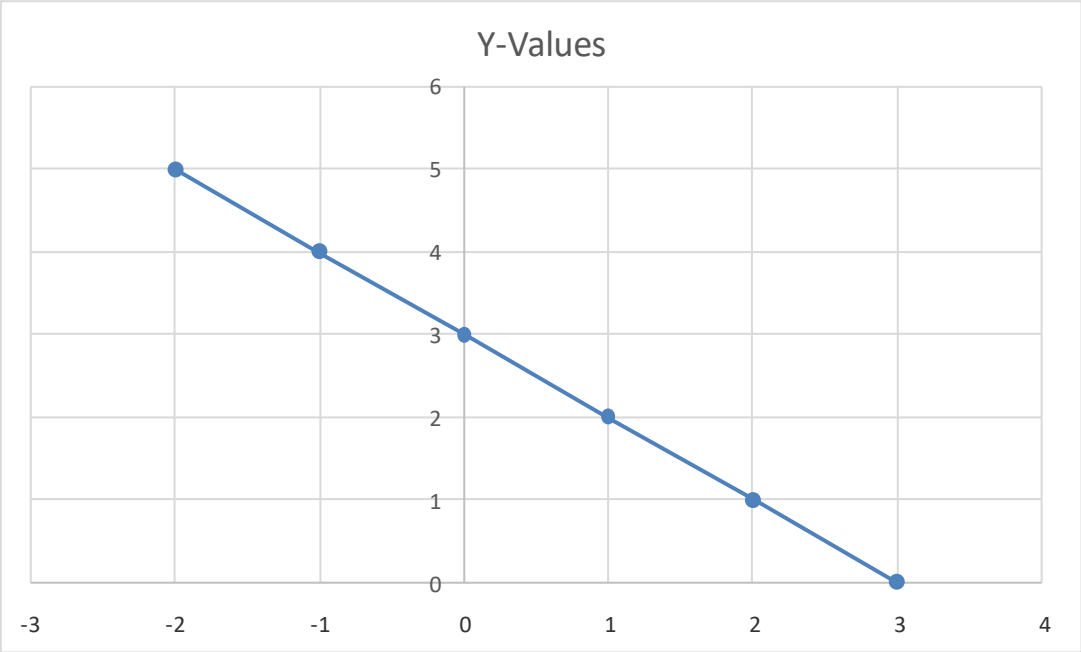
4.3 $x+18=3x-8$ ✓
$x-3x=-18-8$ ✓
$-2x=-26$
$x=13$ ✓
The number is 13 (3)
[12]

QUESTION 5

5.1 5.1.1 Straight line
5.1.2 Negative
5.1.3 Rectangular hyperbola
5.1.4 No y-intercept
5.1.5 Second and fourth

(5 × 1) (5)

5.2



x	-2	-1	0	1	2	3	4
y	5	4	3	2	1	0	-1

(Half a mark each) (5)
[10]

QUESTION 6

6.1 $68^0 + x + \angle ACB = 180^0$ Sum of interior angle of a triangle = 180°✓
$68^0 + x + x = 180^0$ AB = BC isosceles triangles
$68^0 + 2x = 180^0$
$2x = 180^0 - 68^0$ ✓
$\frac{2x}{2} = \frac{112^0}{2}$ ✓
$\therefore x = 56^0$ ✓ (4)

6.2 $\frac{AB}{ED}=\frac{AC}{EF}=\frac{BC}{DF}$

$\frac{16}{24}=\frac{12}{18}=\frac{14}{21}$ ✓

$=\frac{2}{3}$ ✓

$\therefore \Delta ABC /// \Delta EDF$ as the sides are in the same ration✓ (3)

6.3 $(26)^2=(20)^2+x^2$

$\therefore x^2=(26)^2-(20)^2$ ✓

$=676-400$

$x=276$

$x=2\sqrt{69}$ or 16,6✓ (2)

[9]

QUESTION 7

7.1 $\left(\sqrt{2}\right)^2\sin^2 A \bullet \tan A-\sqrt{3}.\tan D$

$=\left(\sqrt{2}\right)^2\sin^2 45^0 \bullet \tan 45^0-\sqrt{3}.\tan 60^0$ ✓✓

$=\left(\sqrt{2}\right)^2\bullet\left(\frac{1}{\sqrt{2}}\right)^2\bullet\frac{1}{1}-\sqrt{3}\bullet\frac{\sqrt{3}}{1}$ ✓✓

$=2\bullet\frac{1}{2}\bullet 1-3$ ✓

$=1-3$

$=-2$ ✓ (6)

7.2 7.2.1 Perimeter = AC^2 +BC+AB✓

$AD^2 = AC^2 - DC^2$

$= 25 - 9$

$=16\ cm^2$✓

$AD = 4$ cm

If AD = 4 cm

ΔADB BD = 10 - 3 = 7 cm

$AB^2 = AD^2 + DB^2$

$= (4)^2 + (7)^2$

$= 16 + 49$

$= 65\ cm^2$ ✓

AB = 8,062 cm ✓

Perimeter = 5 +10 + 8,062

= 23,062 cm✓ (5)

7.2.2

$$\text{Area} = \frac{1}{2}bh \checkmark$$
$$= \frac{1}{2}(10) \times 4 \checkmark\checkmark$$
$$= 20\ cm^2 \checkmark$$

(4)
[15]

TOTAL: 100

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