higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

APRIL EXAMINATION

MATHEMATICS N1

27 MARCH 2014

This marking guideline consists of 7 pages.

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QUESTION 1

1.1 1.1.1 *6 terms* ✓ (1)

1.1.2 -8 ✓ (1)

1.1.3 5 ✓ (1)

1.1.4 $-3y^5-8y^4-12y^3+7y^2+6y+5$ (half mark per term) (3)

1.2 1.2.1 False ✓

1.2.2 False ✓

1.2.3 True ✓

1.2.4 True ✓

(4 x 1) (4)

[10]

QUESTION 2

2.1
$$\frac{(a^3)^4(ab)^3(a^2b)^3}{(a^3b^3)^2(ab)^2}$$
$$=\frac{a^{12}a^3b^3a^6b^3}{a^6b^6a^2b^2} \checkmark$$
$$=\frac{a^{12+3+6}b^{3+3}}{a^{6+2}b^{6+2}} \checkmark$$
$$=\frac{a^{21}b^6}{a^8b^8} \checkmark$$
$$=a^{13}b^{-2} \checkmark$$
$$=\frac{a^{13}}{b^2} \checkmark$$

(5)

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2.2
$$\begin{array}{l} 20x^2-10x+12q \\ 14x^2+10x-10q \\ \hline +6x^2-20x+22q \end{array} \checkmark\checkmark\checkmark \quad (3)$$

2.3
$$\begin{aligned} &6[2x-(x-8)]+4x(2x-5) \\ &=6(2x-x+8)+8x^2-20x \checkmark\checkmark \\ &=6(x+8)+8x^2-20x \checkmark \\ &=6x+48+8x^2-20x \checkmark \\ &=8x^2-14x+48 \checkmark \end{aligned} \quad (5)$$

2.4
$$\begin{aligned} &log_2 100 \quad log_2 25+log_e e^3 \\ &=\log_2\left(\tfrac{100}{25}\right)^2+3\log_e e \checkmark\checkmark \\ &=\log_2 4+3(1) \checkmark \\ &=2\log_2{}^2+3 \checkmark \\ &=5 \checkmark \end{aligned} \quad (5)$$

2.5
$$\begin{aligned} &\frac{x^8-x^5-x^3}{x^3} \\ &\frac{x^3\left(x^5-x^2-1\right)}{x^3} \checkmark \\ &x^5-x^2-1 \checkmark \end{aligned} \quad (2)$$

2.6
$$\begin{aligned} &4xy-xyc+16x-4xc \\ &=(4xy-xyc)+(16x-4xc) \checkmark \\ &=xy(4-c)+4x(4-c) \checkmark \\ &=(xy+4x)(4-c) \checkmark \\ &=x(y+4)(4-c) \checkmark\checkmark \end{aligned} \quad (5)$$

[25]

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QUESTION 3

3.1 $21x^2y^5z^2 = 3\times 7x^2y^5z^2$ ✓
$16x^2y^4z^4 = 2^4x^2y^4z^4$ ✓
$28x^4y^3z^3 = 2^2\times 7x^4y^3z^3$ ✓

3.1.1 $= x^2y^3z^2$ ✓

3.1.2 $= 2^4\times 3\times 7$
$= 336x^4y^5z^4$ ✓ (5)

3.2 $\frac{6}{4x^2}+\frac{7}{x}-\frac{5}{8x}$

$=\frac{2(6)+7(8x)-5(x)}{8x^2}$ ✓✓
$=\frac{12x+56x-5x}{8x^2}$
$=\frac{51x+12}{8x^2}$ ✓ (3)

3.3 $47-6(x-3)=7x$
$47-6x+18=7x$ ✓
$-6x-7x=-47-18$ or $-6x-7x=-65$
$-13x=-65$ ✓
$x=5$ ✓ (3)

3.4 $\frac{y}{3}+12=28$ ✓✓
$\frac{y}{3}=28-12$ ✓
$\frac{y}{3}=16$
$y=48$ ✓ (4)

3.5 $\frac{2m}{d^2}=wv$
$2m=wvd^2$ ✓
$\frac{2m}{wv}=d^2$ ✓
$\therefore d=\sqrt{\frac{2m}{wv}}$ ✓ (3)

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3.6 $d = \sqrt{\frac{2(16)}{4(2)}}$ ✓

$= 2$ ✓ (2)

[20]

QUESTION 4

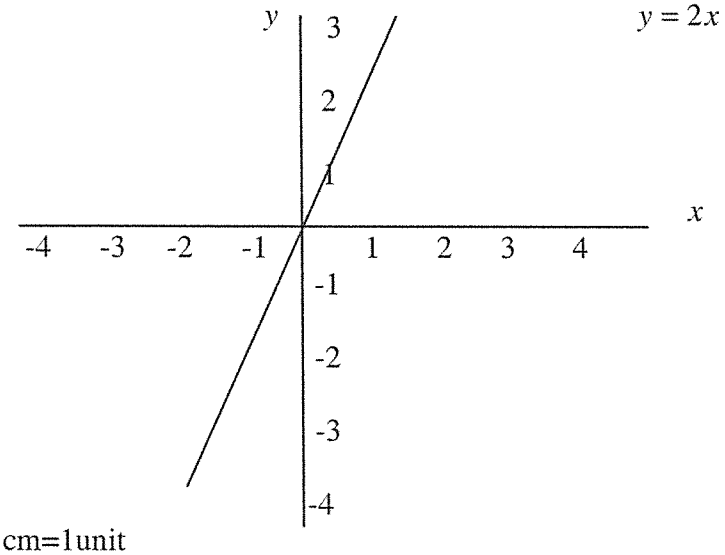
4.1 4.1.1 $y = 3x - 4$ ✓✓ (2)

4.1.2 $y = \frac{1}{4}x$ ✓✓ (2)

4.2

x	-2	-1	0	1	2
y	-4	-2	0	2	4

2 marks for correct table



1cm=1unit

1 mark for correct scale , 2 marks for correct graph (5)

4.3 Straight line graph ✓ (1)

[10]

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QUESTION 5

5.1
$$\frac{\sqrt{2}\tan 45^0 + 8(\sin 45^0)^2 - 6\cos 60^0}{4\sin 30^0}$$
$$= \frac{\sqrt{2}.\frac{1}{1} + 8\left(\frac{1}{\sqrt{2}}\right)^2 - 6.\frac{1}{2}}{4.\frac{1}{2}} \checkmark\checkmark\checkmark$$
$$= \frac{\sqrt{2} + 8\times\frac{1}{2} - 3}{2} \checkmark$$
$$= \frac{\sqrt{2} + 4 - 3}{2} \checkmark$$
$$= \frac{\sqrt{2} + 1}{2} \checkmark$$
(6)

5.2
$A + B = 130^0$ ✓
$x + 86^0 = 130^0$
$x = 44^0$ ✓
(2)

5.3 5.3.1
$\overline{AE} = \overline{EC}$ ✓ given
$A\hat{E}B = D\hat{E}C$ ✓ opposite angles ✓
$\hat{A} = \hat{C}$ ✓ given
$\Delta ABE \equiv \Delta CDE$ Two angles and corresponding side are equal. ✓
(5)

5.3.2
$\Delta CDE = 180^0 - (90^0 + 36^0)$ ✓
$= 54^0$ ✓
or
$90^0 + 36^0 + D = 180^0$ ✓
$D = 180^0 - 124$
$= 54^0$ ✓
(2)

5.4 5.4.1
$\sin B = 0{,}861$
$B = 59{,}429^0$ ✓
(1)

5.4.2
$$B = (\tan 52^0)^2 + \frac{\cos 23^\circ}{2}$$
$B = 1{,}638 + 0{,}46$ ✓✓
$B = 2{,}098$ ✓
(3)

5.5
$(AC)^2 = (AB)^2 + (BC)^2$ ✓
$(56)^2 = (52)^2 + (BC)^2$ ✓
$\therefore (BC)^2 = 432$
$BC = \sqrt{432}$ ✓
$= 20{,}785$ ✓
(4)
[23]

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QUESTION 6

6.1
$$A = \pi\left(R^2 - r^2\right) \checkmark$$
$$= \pi\left[(1.3)^2 - (0.8)^2\right] \checkmark$$
$$= \pi(1{,}69 - 0{,}64) \checkmark$$
$$= 3{,}299 m^2 \checkmark$$
(4)

6.2
$$V = \frac{\pi D^2 h}{4}$$
$$D = \sqrt{\frac{4v}{\pi h}}$$
$$= \sqrt{\frac{4 \times 0{,}589}{\pi \times 0{,}75}} \checkmark\checkmark$$
$$= \sqrt{0{,}999} \checkmark$$
$$= 1m \checkmark$$

OR
$$V = \frac{\pi D^2 h}{4}$$
$$0{,}589 = \frac{\pi D^2 (0{,}75)}{4} \checkmark\checkmark$$
(4)

6.3

6.3.1 $\frac{25}{100}$ √ $\frac{1}{2}$

6.3.2 0,25 √ $\frac{1}{2}$

6.3.3 25% √ $\frac{1}{2}$

6.3.4 $\frac{1}{25}$ √ $\frac{1}{2}$

6.3.5 0,04 √ $\frac{1}{2}$

6.3.6 4% √ $\frac{1}{2}$

6.3.7 $\frac{37{,}5}{100}$ √ $\frac{1}{2}$

6.3.8 *37,5%* √ $\frac{1}{2}$

[12]

TOTAL: 100

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