higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

AUGUST EXAMINATION

MATHEMATICS N1

24 JULY 2014

This marking guideline consists of 8 pages.

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QUESTION 1

1.1 False
1.2 False
1.3 False
1.4 True
1.5 False
1.6 True
1.7 True
1.8 True
1.9 True
1.10 True

(10×1) **[10]**

QUESTION 2

2.1 2.1.1

$$\sqrt[3]{\frac{27a^3b^9}{729b^{12}}} \times \left(\frac{27a^3b^9}{81b^{12}}\right) \times (2a^0b)^3$$

$$= \left(\frac{3^3a^3b^9}{3^4b^{12}}\right)^{\frac{1}{3}} \times 2^3(1)b^3 \checkmark\checkmark$$

$$= \frac{a^3}{3^1b^3} \times 2^3b^3 \checkmark$$

$$= \frac{8a^3}{3} \checkmark$$

(5)

2.1.2

$$64b^9 \times \frac{1}{8}b^{-2} \div b^4$$

$$= 2^6b^9 \times \frac{1}{2^3}b^{-2} \div b^4 \checkmark$$

$$= 2^6b^9 \times 2^{-3}b^{-2} \div b^4 \checkmark$$

$$= 2^{6-3}b^{9-2-4}$$

$$= 2^3b^3 \checkmark$$

$$= 8b^3 \checkmark$$

OR

$$= 8b^{9-2} \times \frac{1}{b^4}$$

$$= 8b^{7-4}$$

$$= 8b^3$$

(4)

2.1.3

$$\log_2 64 - 6\log 1\,000 - 8\log_e \sqrt{e} + 3\log 10$$

$$= \log_2 2^b - 6\log 10^3 - 8\log e^{\frac{1}{2}} + 3\log 10$$

$$= 6(1) - 18(1) - 4(1) + 3$$

$$= -13$$

(5)

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2.2 $15qr+108pq-140bd$
$6qr+115pq+35bd$
$-9qr-7pq-175bd$ ✓✓✓ (3)

2.3
$$\begin{array}{r|l} 2x+1 & 6x^4+3x^3-x^2+\frac{1}{2}x-3 \\ & 3x^3-\frac{1}{2}x+\frac{1}{2}\checkmark\checkmark\checkmark \\ & 6x^4+3x^3\checkmark \\ \hline & -x^2+\frac{1}{2}x\checkmark \\ & (-)-x^2-\frac{1}{2}x \\ \hline & x-3 \\ & (-)x+\frac{1}{2}\checkmark \\ \hline & -\frac{7}{2}\checkmark \end{array}$$
(7)
[24]

QUESTION 3

3.1 $\dfrac{51D^3-85D^8}{17D^2}$
$=\dfrac{17D^3(3-5D^5)}{17D^2}=D(3-5D^5)\checkmark$
$=3D-5D^6$
$D(3-5D^5)\checkmark$ (2)

3.2 $\dfrac{7p^2-21p^3}{4q}\div\dfrac{2p-6p^2}{8q}$
$=\dfrac{7p^2-21p^3}{4q}\times\dfrac{8q}{2p-6p^2}\checkmark$
$=\dfrac{7p^2(1-3p)}{4q}\times\dfrac{8q}{2p(1-3p)}\checkmark$
$=7p\checkmark$ (4)

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3.3 $\frac{3}{x^2}-\frac{4x^2+2x}{x}+3$

$=\frac{3-x(4x^2+2x)+3x^2}{x^2}$ ✓✓

$=\frac{3-4x^3-2x^2+3x^2}{x^2}$ ✓

$=\frac{-4x^3+x^2+3}{x^2}$ ✓ (4)

3.4 $21x^4y^3z^3=3\times7x^4y^3z^3$ ✓

$15x^2y^2z^2=3\times5x^2y^2z^2$ ✓

$27xyz^4=3^3xyz^4$ ✓

3.4.1 $=3^3\times7\times5 \qquad x^4y^32^4$ ✓

$=945x^4y^3z^4$ (4)

3.4.2 $=3xyz^2$ ✓ (1)

3.5 3.5.1 $45pq-27pqz-63pqd$

$9pq(5-3z-7d)$ ✓✓ (2)

3.5.2 $x+6y-6ay-ax$

$=(x-ax)+(6y-6ay)$ ✓✓

$=x(1-a)+6y(1-a)$ ✓

$=(x+6y)(1-a)$ ✓

OR $(x+6y)+(-6ay-ax)$

$(x+6y)-a(6y+x)$

$(x+6y)(1-a)$

(4)
[21]

QUESTION 4

4.1 $5(x-3)=3(x+6)$

$5x-15=3x+18$ ✓

$5x-3x=15+18$

$2x=33$ ✓

$x=16{,}5$ ✓ (3)

4.2 $A=\frac{Qr^2}{2}$

$2A=Qr^2$ ✓

$\frac{2A}{Q}=r^2$ ✓

$\therefore r=\sqrt{\frac{2A}{Q}}$ ✓ (3)

4.3 $2x-6=12$ ✓

$2x=12+6$ ✓

$2x=18$ ✓

$x=9$ ✓ (4)

[10]

QUESTION 5

5.1 $y=4x-1$ √ (1)

5.2 Positive√ (1)

5.3 Rectangular hyperbola√ (1)

5.4 Second and fourth√ (1)

5.5 4√ (1)

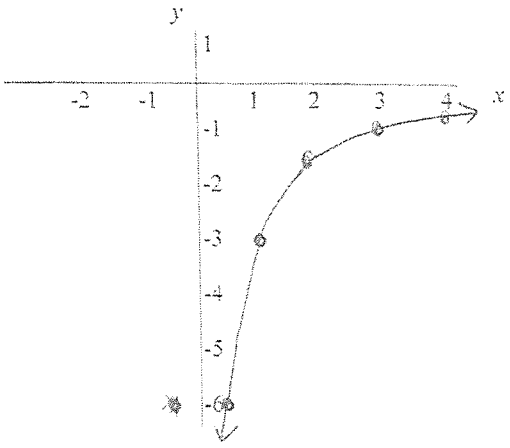
5.6 -1√ (1)

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5.7

x	$\frac{1}{2}$	1	2	3	4
y	-6	-3	$-\frac{3}{2}$	-1	$-\frac{3}{4}$

2 marks for correct table.



√ Scale

√ Graph

Scale 1 cm = 1 unit; 2 marks for correct graph with correct scale (4)
[10]

QUESTION 6

6.1 6.1.1

$$\cos\hat{C} = \frac{BC}{AC}$$
$$= \frac{5}{7}\checkmark$$
$$\hat{C} = \cos^{-1}\frac{5}{7}\checkmark$$
$$= 44{,}415^0\checkmark$$ (3)

6.1.2

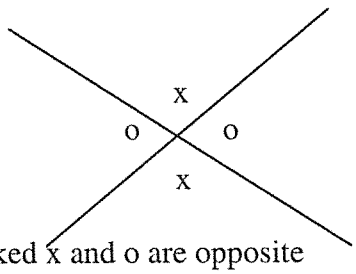
$$(AB)^2 = (AC)^2 - (BC)^2$$
$$= (7)^2 - (5)^2\checkmark$$
$$= 49 - 25$$
$$AB = \sqrt{24}\checkmark$$
$$AB = 4{,}899\ cm\checkmark$$ (3)

6.2 6.2.1



√√ (2)

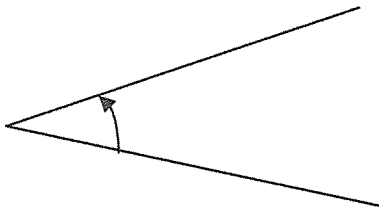
6.2.2



√√√√

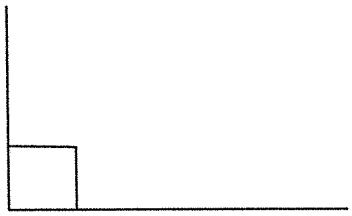
angle marked x and o are opposite (2)

6.2.3



√√ (2)

6.2.4



√√ (2)

6.3 6.3.1 $\tan B = 3{,}775$

$B = \tan^{-1} 3{,}775$

$= 75{,}163^0$ ✓ (1)

6.3.2 $B = \sin 23^0 54' + \cos 62^0 36'$

$= 0{,}405 + 0{,}460$ ✓

$= 0{,}865$ ✓ (2)

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6.4
$$\frac{6\sin 30^0.\tan^2 60^0}{\sin 30^0}$$
$$= \frac{6.\frac{1}{2}\times\left(\frac{\sqrt{3}}{1}\right)^2}{\frac{1}{2}} \checkmark\checkmark$$
$$= \frac{3\times 3}{\frac{1}{2}} \checkmark$$
$$= 9\times 2 \checkmark$$
$$= 18 \checkmark$$ (4)

6.5 Area of rectangle
$A = 6\times 10 \checkmark$
$= 60\ cm^2 \checkmark$
Area of semi-circle
$A = \frac{1}{2}\left(\frac{\pi}{4}D^2\right)$
$= \frac{1}{2}\left(\frac{\pi}{4}.6^2\right) \checkmark$
$= \frac{1}{2}(\pi 9)$
$= 14{,}137 \checkmark$

OR Area of semi-circle
$A = \frac{1}{2}\pi^2$
$A = \frac{1}{2}\pi(2^2)$
$A = 6{,}283$

Area of a figure
60 – 6,283
= 53,717 cm^2 (4)
[25]

TOTAL: 100

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