higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

APRIL EXAMINATION

MATHEMATICS N1

22 MARCH 2013

This marking guideline consists of 7 pages.

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QUESTION 1

1.1 1.1.1 83,333 m/s ✓✓ (2)

1.1.2 $\frac{1}{20}$ ✓ or 0,05 (1)

1.1.3 30,995 % ✓ (1)

1.2 1.2.1 3 ,2, 1 ✓✓ any 2 for 2 marks (2)

1.2.2 coefficient ✓ (1)

1.2.3 x ✓ (1)

1.2.4 -7 ✓ (1)

1.2.5 4 ✓ (1)
[10]

QUESTION 2

2.1
$$-(6b^3)^0 \times \sqrt[4]{\frac{81a^6b}{256a^{-2}b^9}}$$
$$= -(1) \times \left(\frac{3^4a^8}{2^8b^8}\right)^{\frac{1}{4}} \quad \checkmark\checkmark\checkmark\checkmark\checkmark$$
$$= -1 \times \frac{3a^2}{2^2b^2}$$
$$= -\frac{3a^2}{4b^2}$$
(5)

2.2
$$\begin{array}{r} 14x^2 - 10y + 16x \\ 20x^2 + 12y - 10x \\ \hline -6x^2 - 22y + 26x \end{array}$$
✓✓✓ 1 mark per term (3)

2.3
$$(a-2)(a^3+3a^2-5a-6)$$
$$= a^4 + 3a^3 - 5a^2 - 6a - 2a^3 - 6a^2 + 10a + 12$$
$$= a^4 + a^3 - 11a^2 + 4a + 12$$
✓✓✓✓✓ per term (5)

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2.4 $\log_2 64 - 3\log_{10} 100 - 1log_3 9 + \log_e e^6$

$= \log_2 2^6 - 3\log_{10} 10^2 - \log_3 3^2 + \log_e e^6$ ✓✓✓✓✓

$= 6(1) - 6(1) - 2(1) + 6(1)$

$= 4$

(5)
[18]

QUESTION 3

3.1 Arrange in descending powers first: $5x^3 + 4x^2 - 6x + 2$ by $x + 2$

$5x^2 - 6x + 6$ ✓✓✓ 1 per term

$x+2$) $5x^3 + 4x^2 - 6x + 2$

$5x^3 + 10x^2$ ✓

$-6x^2 - 6x + 2$ ✓

$-6x^2 - 12x$

$+6x + 2$

$+6x + 12$ ✓

-10 ✓

$5x^2 - 6x + 6$ remainder -10

(7)

3.2 3.2.1 $63ab - 56ac + 7ad$

$= 7a(9b - 8c + d)$ ✓✓

(2)

3.2.2 $3xy - xyd + 12x - 4xd$

$= (3xy - xyd) + (12x - 4xd)$

$= xy(3 - d) + 4x(3 - d)$ ✓✓✓✓✓✓

$= (xy + 4x)(3 - d)$

$= x(y + 4)(3 - d)$

(6)

3.3 $\dfrac{xy - x^2y^2}{xy} \div \dfrac{2 - 2xy}{20}$

$= \dfrac{xy(1 - xy)}{xy} \times \dfrac{20}{2(1 - xy)}$ ✓✓✓✓

$= \dfrac{20}{2}$

$= 10$

(4)

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3.4 3.4.1

$54x^4y^5z^2 = 2\times3^3 \quad x^4y^5z^2$

$48x^2y^4z^5 = 2^4\times3 \quad x^2y^4z^5$ ✓✓✓

$63x^5y^2z^3 = 3^2\times7 \quad x^5y^2z^3$ (3)

3.4.2 LCM

$= 2^4\times3^3\times7x^5y^5z^5$ ✓✓

$= 3024^5\,y^5z^5$ (2)

3.4.3 HCF

$= 3\times x^2y^2z^2$ ✓✓

$= 3x^2y^2z^2$ (2)

[26]

QUESTION 4

4.1 $4(x-2)-(7x-9)+6=2$

$4x-8-7x+9+6-2=0$

$-3x+5=0$ ✓✓✓✓ 1 mark each step

$-3x=-5$

$x=\frac{5}{3}$ (4)

4.2 $x+(x+1)+(x+2)=135$

$3x+3=135$

$3x=135-3$ ✓✓✓

$\frac{3x}{3}=\frac{132}{3}$

$x=44$

44 ; 45 ; 46

46 is the largest number ✓ (4)

4.3 $A=4\pi r^2$

$\frac{A}{4\pi}=r^2$ ✓✓

$\therefore r=\sqrt{\frac{A}{4\pi}}$ (2)

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4.4 $r = \sqrt{\frac{A}{4\pi}}$

$r = \sqrt{\frac{10}{4\pi}}$ ✓✓

$r = 0{,}892$ (2)

[12]

QUESTION 5

5.1 5.1.1 2 ✓✓ (2)

5.1.2 4 ✓ (1)

5.1.3 -2 ✓ (1)

5.1.4 $y = 2x + 4$ ✓✓✓ (3)

5.1.5 Straight line graph ✓ (1)

5.1.6 Hyperbola✓

5.1.7 First quadrant ✓ (1)

[10]

QUESTION 6

6.1 6.1.1 $30° + x = 90°$ *right angle*

$\therefore x = 90° - 30°$ ✓✓✓

$x = 60°$ (3)

6.1.2 $y = 60°$ ✓ [isosceles triangle] ✓ (2)

6.1.3 $x + y + z = 180°$ *interior <'s of Δ*

$60° + 60° + z = 180°$

$120° + z = 180°$✓✓✓

$z = 180° - 120°$

$z = 60°$ (3)

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6.2 $r = \frac{D}{2} = \frac{36}{2} = 18\,cm$ ✓

$A = \pi r^2$ ✓

Area of a half-circle

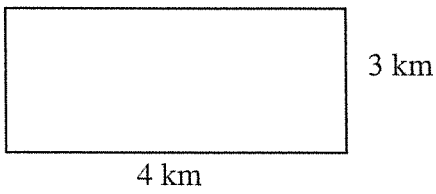
$= \frac{1}{2}\pi r^2$ or $A = \frac{\pi D^2}{4} x0,5$

$= \frac{1}{2}\pi 18^2$ $= \frac{\pi(36)^2}{4} x0,5$ ✓ ✓

$= 508,938 cm^2$ $= 508,938$

(4)

6.3



Perimeter = 2 (L + b) ✓

= 2 (4 + 3) ✓

= 2 (7)

= 14 km ✓

(3)

6.4 $\frac{3.Sin30^o.\tan^2 60^o}{Sin^2 30^o}$

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

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

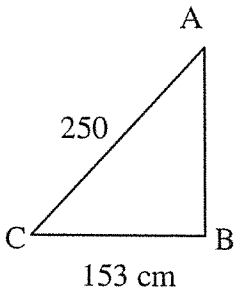
$= \frac{9}{2}.\frac{4}{1}$

$= 18$

(5)

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6.5



$(AB)^2 = (AC)^2 - (BC)^2$

$=(250)^2 - (153)^2$ ✓ ✓

$= 62\,500 - 23\,409$

$AB = \sqrt{39091}$

$= 197{,}714$ ✓ ✓

(4)

[24]

TOTAL: 100

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