higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

MATHEMATICS N1

23 JULY 2018 (X-Paper)
09:00–12:00

This marking guideline consists of 7 pages.

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QUESTION 1

1.1 1.1.1
$= a^2b^3 \times a^4b^2$
$= a^{2+4}b^{3+2}$
$= a^6b^5$ ✓✓ (2)

1.1.2
$= \frac{27\overset{\checkmark}{x^9}y^6 \times \overset{\checkmark}{1}}{x^2y^2}$ ✓
$= 27x^7y^4$ ✓ (4)

1.1.3
$= \sqrt{73-9}$ ✓ $\times 2(1)$ ✓$+1$✓
$= \sqrt{64} \times 2+1$
$= 8\times 2+1$
$= 17$✓ (4)

1.2 1.2.1
$\log 25 + \log 4$
$= \log(25\times 4)$
$= \log 100$ ✓
$= \log_{10} 10^2$
$= 2\log_{10} 10$
$= 2(1)$
$=2$✓ (2)

1.2.2
$= \frac{\log 2^3}{\log 7} \times \frac{\log 7^2}{\log 2^2}$
$= \frac{3\log 2}{\log 7} \times \frac{2\log 7}{2\log 2}$ ✓✓
$= \frac{6}{2}$
$= 3$✓ (3)
[15]

QUESTION 2

2.1
$$x+2\overline{)x^3+x^2-4x-4}$$
x^2-x-2 ✓✓✓

x^3+2x^2
$-x^2-4x$
$-x^2-2x$
$-2x-4$
$-2x-4$
0

(3)

2.2
$$-2x^2+x+3-(7x-8x^2+3)$$
$$=-2x^2+x+3-7x+8x^2-3$$
$$=\ 6x^2\checkmark-6x\checkmark+0\checkmark$$

(3)
[6]

QUESTION 3

3.1 3.1.1
$$=4(6x-3yx^2+4y^2)\checkmark\checkmark$$

(2)

3.1.2
$$=5a^2+a^2b+5b+b^2\checkmark$$
$$=(5a^2+5b)+(a^2b+b^2)$$
$$=5(a^2+b)+b(a^2+b)$$
$$=(a^2+b)(5+b)\checkmark\checkmark$$

or
$$=5a^2+a^2b+5b+b^2$$
$$=(5a^2+a^2b)+(5b+b^2)$$
$$=a^2(5+b)+b(5+b)$$
$$=(5+b)(a^2+b)$$

(3)

3.2 3.2.1
$$=\frac{3x^2+4x^2-7x^2\checkmark\checkmark}{6\checkmark}$$
$$=\ 0\checkmark$$

(4)

3.2.2
$$=\frac{x^2-4x}{4y}\times\frac{4xy}{xy(x-y)}\times\frac{y^2-y}{x}\checkmark$$
$$=\frac{x(x-4)\checkmark}{4y}\times\frac{4xy}{xy(x-y)}\times\frac{y(y-1)}{x}\checkmark$$
$$=\frac{(x-4)(y-1)\checkmark}{x-y\checkmark}$$

(5)

3.3
$$5m^2n^4l^2=\ 5\times m^2n^4l^2$$
$$15mn^3l\ =\ 3\times5\times mn^3l\checkmark$$
$$10m^3nl^4=\ 2\times5\times m^3nl^4\checkmark$$

LCM $=2\times3\times5\times m^3n^4l^4$
$=30\checkmark m^3n^4l^4\checkmark$

HCF $=5\checkmark mnl\checkmark$

(6)
[20]

QUESTION 4

4.1 4.1.1

$$5x - 20 \checkmark = 3x - 6 \checkmark$$
$$5x - 3x = -6 + 20$$
$$2x = 14 \checkmark$$
$$x = 7 \checkmark$$

(4)

4.1.2

$$3x - 15 = 12$$
$$3x = 27 \checkmark$$
$$x = 9 \checkmark$$

(2)

4.2

	Age now	**Age in 4years**
Mavis	x	$x+4$
Sarah	$5x$	$5x+4$

$5x + 4 = 3(x + 4)$ ✓✓
$5x + 4 = 3x + 12$
$5x - 3x = 12 - 4$
$2x = 8$
$x = 4$

Mavis's age is 4 years✓ and Sarah's age is 20 years.✓ (4)

4.3 4.3.1

$$V = \pi r^2 h$$
$$r^2 = \frac{V}{\pi h} \checkmark$$
$$r = \sqrt{\frac{V}{\pi h}} \checkmark$$

4.3.2

$$r = \sqrt{\frac{630}{\pi 5}} \checkmark$$
$$r = 6{,}333\ cm \checkmark$$

(2 × 2) (4)
[14]

QUESTION 5

5.1 5.1.1

$A(0\,;6)$✓
$B(-3\,;0)$✓ (2)

5.1.2 $m = 2$ (1)

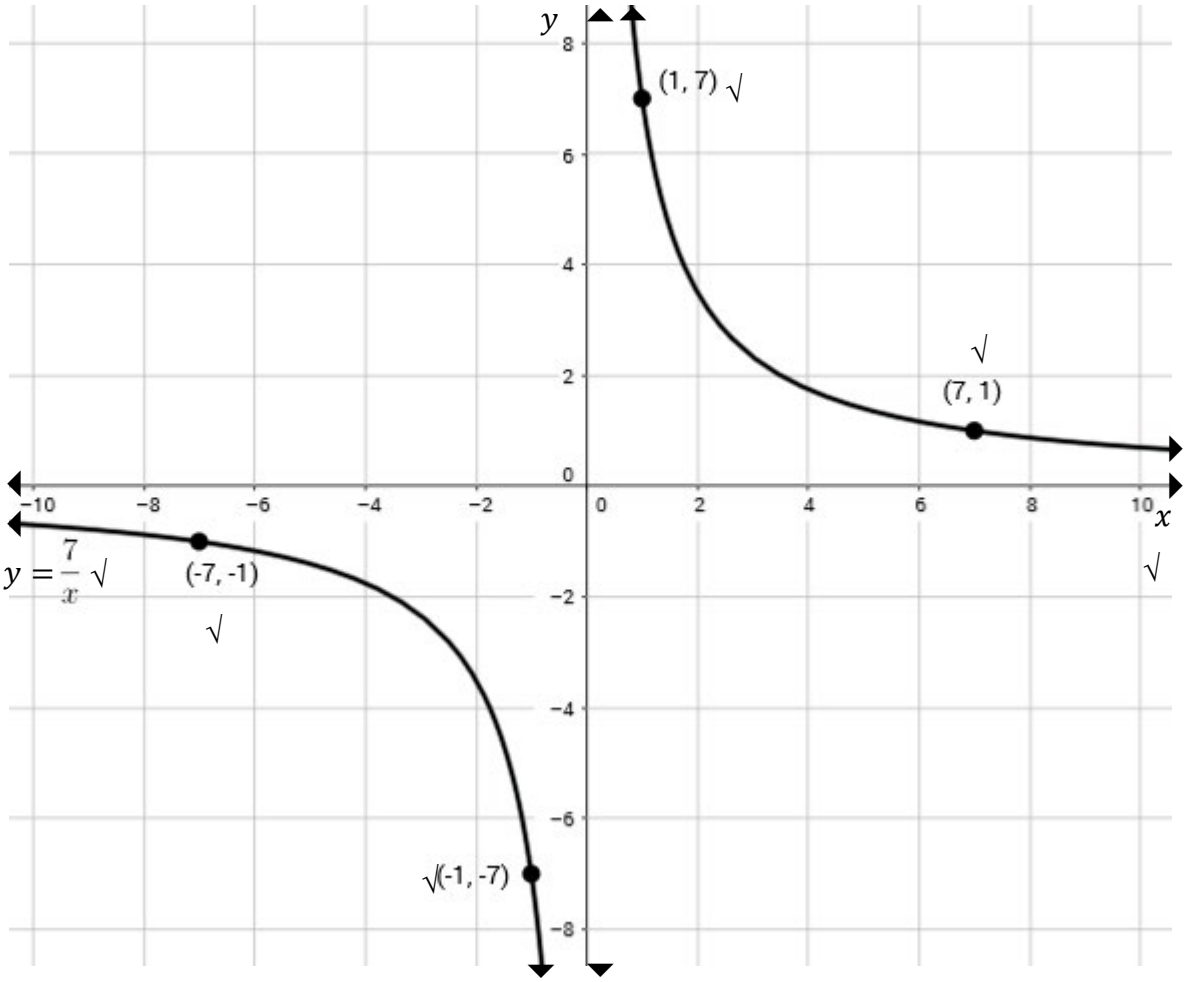
5.1.3 $y = 2x + 6$ (1)

5.2 5.2.1

x	-7	-1	1	7
y	-1	-7	7	1

✓✓ (2)

5.2.2



(3)

5.2.3 Direct relation.

5.2.4 Hyperbola.

(2 × 1) (2)

[11]

QUESTION 6

6.1 6.1.1 A triangle that consists of two equal sides.

6.1.2 When the sum of two angles are equal to 180°.

(2 × 1) (2)

6.2 6.2.1 $\frac{AB}{EF} = \frac{BC}{FG} = \frac{AC}{EG}$ ✓ ✓

(1)

6.2.2 $\frac{AB}{EF} = \frac{BC}{FG}$

$\frac{15}{5} = \frac{45}{x}$✓

$x = \frac{45 \times 5}{15}$

$x = 15\ cm$✓ (2)

6.3 $\hat{R}_1 = 70^0$ ($\angle s$ opp. Equal sides)

$y = 40^0$(*sum* of $\angle s$ of a Δ)✓✓

$x = 110^0$($\angle s$ on a str. Line)✓✓

OR

$x = 40^0 + 70^0$(*ext.*$\angle$ of a Δ) (4)
[9]

QUESTION 7

7.1 $= \frac{1}{\sqrt{2}}$ ✓$\times \frac{1}{\sqrt{3}} \times \frac{1}{\sqrt{3}}$ ✓$\div \frac{\sqrt{3}}{2}$ ✓

$= \frac{2}{3\sqrt{6}}$✓ (4)

7.1 7.2.1 $\sin \hat{R} = \frac{r}{s}$

7.2.2 $\cos \hat{T} = \frac{r}{s}$

(2 × 1) (2)

7.3 7.3.1 $= \sin(30^0 + 40^0)$

$= \sin(70^0)$ ✓

$= 0{,}940$✓ (2)

7.3.2 $= \cos 30^0 + \cos 40^0$

$= 0{,}866025403$ ✓$+ 0{,}766044443$✓

$= 1{,}632$✓ (3)
[11]

QUESTION 8

8.1 R14,30 – R13,88✓
= 0,42✓

$$\text{Percentage increase} = \frac{R0,42}{R13,88} \times \frac{100}{1}$$
$$= 3,025\%\checkmark$$ (3)

8.2 $$A = \frac{1}{2}\text{base} \times height \checkmark$$
$$8 = \frac{1}{2},3 \times height \checkmark$$
$$16 = 3 \times height$$
$$\text{Height} = \frac{16}{3}$$
$$h = 5,333\ cm\checkmark$$ (3)

8.3 8.3.1 $$V = l \times b \times h \checkmark$$
$$= 4 \times 1.5 \times 2 \checkmark$$
$$= 12\ cm^3 \checkmark$$ (3)

8.3.2 $$= 12\ ml \checkmark$$ (1)

8.3.3 $$A = 2(bl + lh + bh)$$
$$= 2(1,5 \times 4 + 4 \times 2 + 1,5 \times 2) \checkmark$$
$$= 2(6 + 8 + 3)\ cm^2 \checkmark$$
$$= 34\checkmark \text{cm}^2 \checkmark$$ (4)

[14]

TOTAL: 100

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