higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

MATHEMATICS N1

26 MARCH 2018

This marking guideline consists of 7 pages.

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QUESTION 1

1.1 1.1.1 $= a^6 \times a^4$ ✓
$= a^{10}$ ✓ (2)

1.1.2 $= \frac{x^8}{x^8} + 3(1)$ ✓✓
$= 1 + 3$ ✓
$= 4$ ✓ (4)

1.1.3 $= (5^2)^{\frac{1}{2}} \times 2x^{a+b+a-b}$ ✓
$= 5 \times 2x^{2a}$ ✓
$= 10x^{2a}$ ✓ (3)

1.2 1.2.1 $= \log_7 7^2 + \log_2 2^3$
$= 2\log_7 7$ ✓ $+ 3\log_2 2$ ✓
$= 2(1) + 3(1)$
$= 5$ ✓ (3)

1.2.2 $= m\log_2 2 \times m(5^3)^{\frac{1}{3}} \log_{10} 10^2$ ✓
$= m(1) \times 5m \times 2\log_{10} 10$
$= m \times 5m \times 2(1)$ ✓
$= 10m^2$ ✓ (3)

[15]

QUESTION 2

2.1 $= 2x^2 - 3x + 5 - (x^2 - 7x + 1)$
$= 2x^2 - 3x + 5 - x^2 + 7x - 1$
$= x^2 + 4x + 4$ ✓✓✓ (3)

2.2
$$x - 3 \overline{)\, x^3 + 5x^2 + 7x + 2} \quad \checkmark\checkmark$$
$$x^2 + 8x + 31$$
$$-\underline{(x^3 \ 3x^2)}$$
$$8x^2 \ 7x$$
$$-\underline{(8x^2 - 24x)}$$
$$31x + 2$$
$$-\underline{(31x - 93)}$$
$$95$$
(3)

2.3 $= 9a^2 + 15a - 15a - 25$
$= 9a^2$ ✓ $- 25$ ✓ (2)

[8]

QUESTION 3

3.1 3.1.1 $= 4a✓(a^2 - 2ab + 3)✓$ (2)

3.1.2 $= (x^4 + x^3) + (4x + 4)✓$
$= x^3(x + 1) + 4(x + 1)✓$
$= (x + 1)(x^3 + 4)✓✓$

or $= (x^4 + 4x) + (x^3 + 4)$
$= x(x^3 + 4) + (x^3 + 4)$
$= (x^3 + 4)(x + 1)$ (4)

3.2 $= \frac{3(x+2)}{6} \overset{✓}{\times} \frac{2}{x(x+2)}$ ✓✓
$= \frac{1}{x}✓$ (4)

3.3 $9a^2bc = 3^2 \times a^2bc✓$
$12a^4b^5c^4 = 2^2 \times 3 \times a^4b^5c^4✓$
$15a^3b^3c^2 = 3 \times 5 \times a^3b^3c^2✓$
LCM$= 2^2 \times 3^2 \times 5 \times a^4b^5c^4$
$= 180✓a^4b^5c^4✓$

HCF$= 3✓a^2bc✓$ (7)
[17]

QUESTION 4

4.1 4.1.1 $5x + 3 = 2x - 3$
$3x = -6$ ✓
$x = -2$ ✓ (2)

4.1.2 $\overset{✓}{3x} - \overset{✓}{6} - x - 1 = 3$
$2x = 3 + 6 + 1$
$2x = 10$ ✓
$x = 5$ ✓ (4)

4.2 $(2x) + (2x + 2) + (2x + 4) + (2x + 6) = 76$
$8x + 12 = 76$
$8x = 64$
$x = 8$

The numbers are:

$2x$	$2x + 2$	$2x + 4$	$2x + 6$
$= 2(8)$	$= 2(8) + 2$	$= 2(8) + 4$	$= 2(8) + 6$
$= 16✓$	$= 18✓$	$= 20✓$	$= 22✓$

(4)

4.3 4.3.1 V$= l \times b \times h$
$b = \frac{V}{lh}$ ✓ (1)

4.3.2 $b = \dfrac{180}{9 \times 5}$ ✓

$b = 4$ m✓ (2)

4.4 No. of litres $= \dfrac{494 \text{ km}}{13 \text{ km}}$ ✓

$= 38\ \ell$✓ (2)

[15]

QUESTION 5

5.1 5.1.1 $2y = 8x - 4$

$y = 4x - 2$ ✓✓ (2)

5.1.2 Gradient or $m = 4$ ✓ (1)

5.1.3 $y = 4x - 2$

x	-2	-1	0	1	2
y	-10	-6	-2	2	6

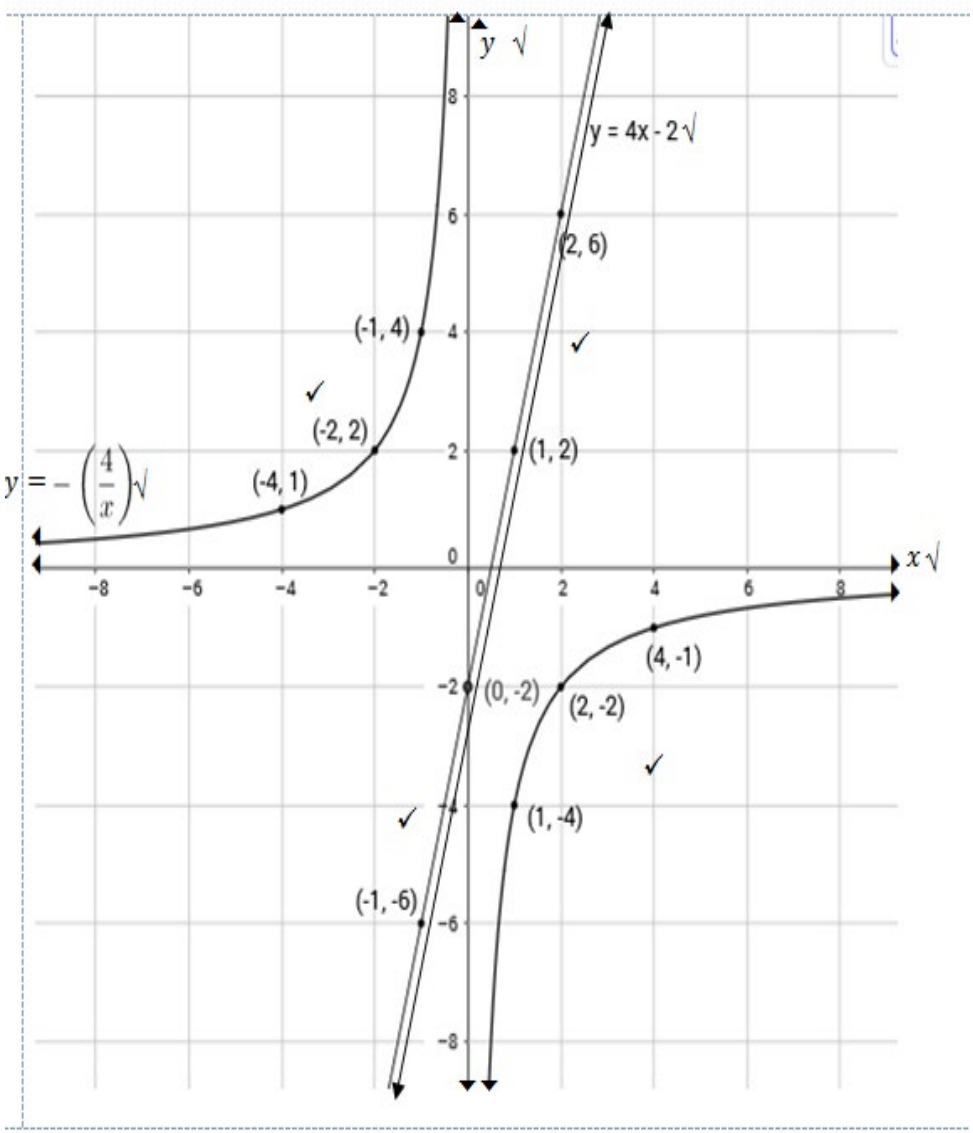
✓✓ (5)

5.2 $y = -\dfrac{4}{x}$

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

✓✓ (5)

5.1.3 & 5.2



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QUESTION 6

6.1 6.1.1 $\frac{AB}{DE} = \frac{BC}{EF\sqrt{}} = \frac{AC}{DF\sqrt{}}$ (1)

6.1.2
$$\frac{AB}{DE} = \frac{AC}{DF}$$
$$\frac{14}{7} = \frac{x}{12}\checkmark$$
$$x = \frac{14 \times 12}{7}$$
$$x = 24 \text{ cm}\checkmark$$ (2)

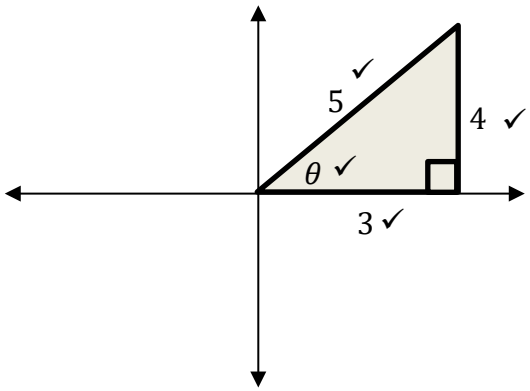
6.2 $\Delta KLM = \Delta DEF\checkmark(s\angle s)\checkmark$ (2)

6.3 $\hat{R}_1 = 60°$ ✓ (equilateral Δ)✓
$\hat{R}_2 = 120°$ ✓ ($\angle's$ on straight line)✓

(4)
[9]

QUESTION 7

7.1 7.1.1 $r^2 = x^2 + y^2$
$5^2 = x^2 + 4^2$
$25 = x^2 + 16$
$x^2 = 9$
$x = 3$



(4)

7.1.2 $\cos\theta = \frac{3}{5}$✓

(1)

7.1.3 $\tan\theta = \frac{4}{3}$✓

(1)

7.2 $QR^2 = PR^2 - PQ^2$ (Pythagoras)
$QR = \sqrt{60^2 - 30^2}$✓
$QR = 51{,}961$ cm✓✓

(3)
[9]

QUESTION 8

8.1 8.1.1

$13^2 = AT^2 + 5^2$

$169 = AT^2 + 25$✓

$AT^2 = 144$

$AT = 12$ ✓✓ (3)

8.1.2

$C = (20 + 13 + 15 + 12)$✓

$C = 60$ cm✓ (2)

8.1.3

$A = \frac{20 + 15}{2}$✓ $\times 12$✓

$A = 210$ cm²✓ (3)

8.2

$= \frac{15}{100} \times 320$ kg or $= 320 - \left(320 \times \frac{15}{100}\right)$

$= 48$ kg ✓

Decrease $= 320$ kg $-$ 48 kg $= 320 - 48$

$= 272$ kg✓ $= 272$ kg (2)

8.3

Total cost $= \underset{\checkmark}{\text{R}700} + (\frac{13}{100} \times \underset{\checkmark}{\text{R}700})$

$=$ R700 + R91✓

$=$ R791✓ (4)

[14]

TOTAL: 100

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