higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICS
NQF LEVEL 2
(Second paper)

19 February 2024

This marking guideline consists of 8 pages.

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One mark = ✓
Half mark = √

QUESTION 1

1.1 1.1.1 The number of participants or observations included in a study✓✓

1.1.2 The most common number in a data set✓✓

(2 × 2) (4)

1.2 1.2.1

Stem	Leaf	
1	5	✓
2	5, 8	✓
3	0, 4, 5, 7, 7, 9	✓
4	4, 7	✓
5	0, 0, 5, 6, 7, 7, 7, 7, 7	✓

(5)

1.2.2 $\text{Mean} = \frac{867}{20}$ ✓
$= 43{,}35$ ✓ (2)

1.2.3 $\text{Median} = \frac{1}{2}(20+1)\text{ position}$
$= 10{,}5\text{ position}$ ✓
$= \frac{44+47}{2}$
$= 45{,}5$ ✓ (2)

1.2.4 Mode $= 57$ ✓✓ (2)

1.3 65, 66, 66, 67, 71, 72, 74, 75, 77, 80, 81, 88

1.3.1 $Q1 = \frac{1}{4}(12+1)$
$= 3{,}25\text{ position}$✓
$= 66 + 0{,}25\ (67 - 66)$
$= 66{,}25$ ✓
or

$Q1 = \frac{66+67}{2} = 66{,}5$ ✓✓ (2)

1.3.2 $Q3 = \frac{3}{4}(12+1)$
$= 9{,}75\ \text{ position}$✓
$= 77 + 0{,}75\ (80 - 77)$
$= 79{,}25$ ✓
or

$$Q3 = \frac{77+80}{2} = 78{,}5 \checkmark\checkmark \quad (2)$$

1.3.3 $\text{Interquartile} = Q3 - Q1$
$= 79{,}25 - 66{,}25 \checkmark$
$= 13 \checkmark$
Or
$\text{Interquartile} = Q3 - Q1$
$= 78{,}5 - 66{,}5 \checkmark$
$= 12 \checkmark$ (2)

1.3.4 $\text{Range} = 88 - 65 = 23$ (1)

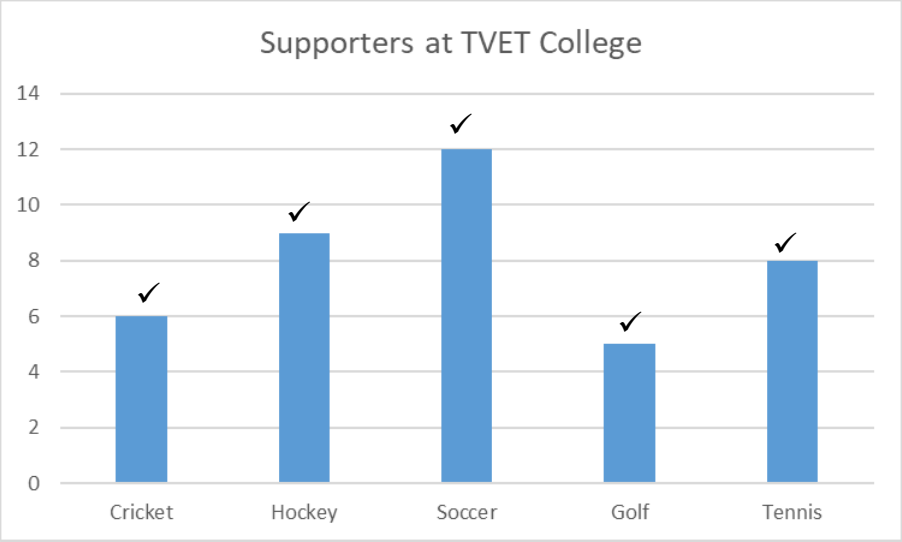
1.3.5 $68\text{th percentile} = \frac{68}{100}(12+1) \checkmark$
$= 8{,}84 \text{ position} \checkmark$
$= 75 + 0{,}84\,(77 - 75)$
$= 76{,}68 \checkmark$ (3)

1.4 1.4.1

SPORTS	TALLY	FREQUENCY
Cricket	~~1111~~ **1**√	6√
Hockey	~~1111~~ 1111√	9√
Soccer	~~1111~~ ~~1111~~ **11**√	12√
Golf	~~1111~~√	5√
Tennis	~~1111~~ 111√	8√
	TOTAL:	40

(½ mark for each tally + ½ mark for each frequency) (5)

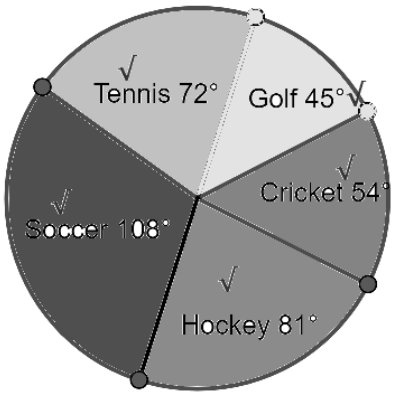
1.4.2



One mark for each correct bar. (5)

1.4.3

SPORTS	DEGREE
Cricket	54°√
Hockey	81°√
Soccer	108°√
Golf	45°√
Tennis	72°√



(½ mark for each degree + ½ mark for each correct sector) (5)
[40]

QUESTION 2

2.1 2.1.1

$AB = \sqrt{(9-4)^2 + (1-4)^2}$ ✓

$= \sqrt{25+9}$ ✓

$= \sqrt{34}$

$= 5{,}83$ units ✓ (3)

2.1.2

$M\left(\frac{9+7}{2}; \frac{1+(-2)}{2}\right)$

$M\left(8; -\frac{1}{2}\right)$ ✓✓ (2)

2.1.3

$m_{CD} = \frac{-2-0}{7-3}$ ✓

$= -\frac{1}{2}$ ✓ (2)

2.1.4

$m_{BC} = \frac{-2-1}{7-9} = \frac{3}{2}$ ✓

$y = \frac{3}{2}x + c$

At point B

$c = 1 - \frac{3}{2}(9)$ ✓

$= -\frac{25}{2}$ ✓

Equation of BC

$y = \frac{3}{2}x - \frac{25}{2}$ ✓ (4)

2.2 2.2.1

Area of the circular plate = $\pi \times (2)^2$ ✓

= 12,566 cm^2 ✓ (2)

2.2.2

Area of square $= 1 = 2 \times 2 = 4$ cm^2 ✓✓

Area of square $= 2 = 3 \times 3 = 9$ cm^2 ✓✓ (4)

2.2.3

Area of rectangular plate $= 12 \times 8 = 96$ cm^2 ✓

Area of the plate after cutting squares and circle

$= 96 - (12{,}566 + 4 + 9)$ ✓✓

$= 70{,}434$ cm^2 ✓ (3)

2.3 $\text{Volume} = \left(\frac{1}{2}b \times \perp h\right)\text{height}$ ✓

$= \left(\frac{1}{2} \times 15 \times 25\right)10$ ✓✓

$= 1875 \text{ cm}^2$ ✓ (4)

2.4 2.4.1 C' (-4 ; -4) ✓✓

2.4.2 B' (5 ; -3) ✓✓

2.4.3 A' (4 ; -4) ✓✓

(6)
[30]

QUESTION 3

3.1 3.1.1 $\sin 70^\circ = \frac{40}{BC}$ ✓

$\therefore BC = \frac{40}{\sin 70^\circ}$ ✓

$\therefore BC = 42{,}567$ ✓

3.1.2 $1 - \sin^2 70^\circ = 1 - (\frac{40}{42{,}567})^2$ ✓✓

$= 0{,}117$ ✓

3.1.3 $AC = \sqrt{(42{,}567)^2 - (40)^2}$ ✓

$AC = 14{,}558$ ✓

$\tan 70^\circ = \frac{40}{14{,}558} = 2{,}748$ ✓

(3 × 3) (9)

3.2 3.2.1 $(OP)\ 5 = \sqrt{(a-0)^2 + (4-0)^2}$ ✓

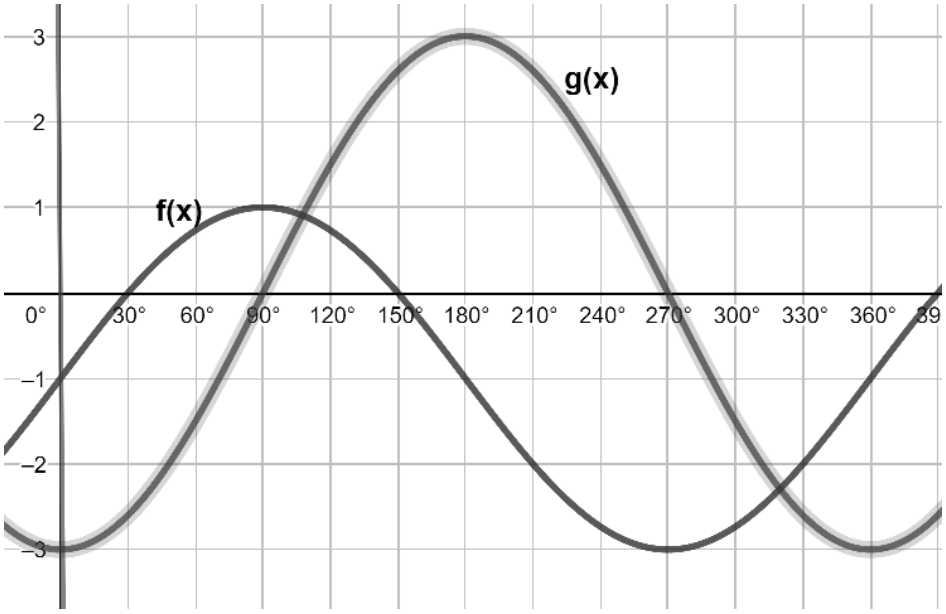
$25 = a^2 + 4^2$ ✓

$\therefore a = 25 - 16 = 3$ ✓ (3)

3.2.2 Coordinate of Q = (3;0) ✓✓ (2)

3.3 3.3.1

x	**0°**	**30°**	**60°**	**90°**	**120°**	**150°**	**180°**	**210°**	**240°**	**270°**	**300°**	**330°**	**360°**
$f(x)$	-1	0	-0,732	1	0,732	0	-1	-2	-2,732	-3	-2,732	-2	-1
$g(x)$	-3	-2,59	-1,5	0	1,5	2,598	3	2,598	1,5	0	-1,5	-2,598	-3



(½ for each point of intersection + 3 for graph)✓✓✓✓
(4 for graph + 2 for table) (6)

3.3.2 Domains of $g(x) = 0^\circ \leq x \leq 360^\circ$ ✓✓ **OR** $[0^\circ;360^\circ]$ (2)

3.3.3 $-3 \leq y \leq 3$ ✓✓ (2)

3.3.4 2 (1)

3.3.5 360° (1)

3.4 $\text{BD} = \dfrac{2\,000}{\tan 30^\circ}$ ✓

$\text{BD} = 3\,464{,}102$ m ✓

$\text{BC} = \dfrac{2\,000}{\tan 60^\circ}$

$= 1\,154{,}700$ ✓

Distance between the boats $\text{CD} = 3\,464{,}102 - 1\,154{,}700 = 2\,309{,}402$ m ✓ (4)

[30]

TOTAL: 100

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