higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICS
NQF LEVEL 2
(Second paper)

6 November 2024

This marking guideline consists of 9 pages.

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QUESTION 1

NB: Half Mark = ✓ and Full mark =✓

1.1 1.1.1 The average of a data set, found by adding numbers together and then dividing the sum of the numbers by the number of numbers.✓✓

1.1.2 The middle value of ordered data.✓✓

(2 × 2) (4)

1.2 1.2.1

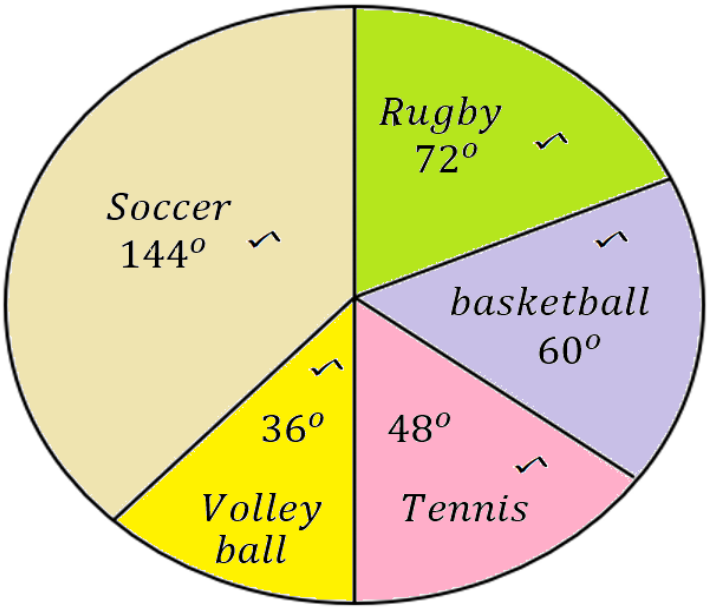
Frequency distribution table: Choice of sport		
Sport	**Tally**	**Frequency**
Basketball	~~IIII~~ ✓	5 ✓
Rugby	~~IIII~~ I ✓	6 ✓
Soccer	~~IIII~~ ~~IIII~~ II ✓	12 ✓
Tennis	IIII	4
Volleyball	III ✓	3 ✓
	TOTAL:	30 ✓

(5)

1.2.2 Soccer✓ (1)

1.2.3

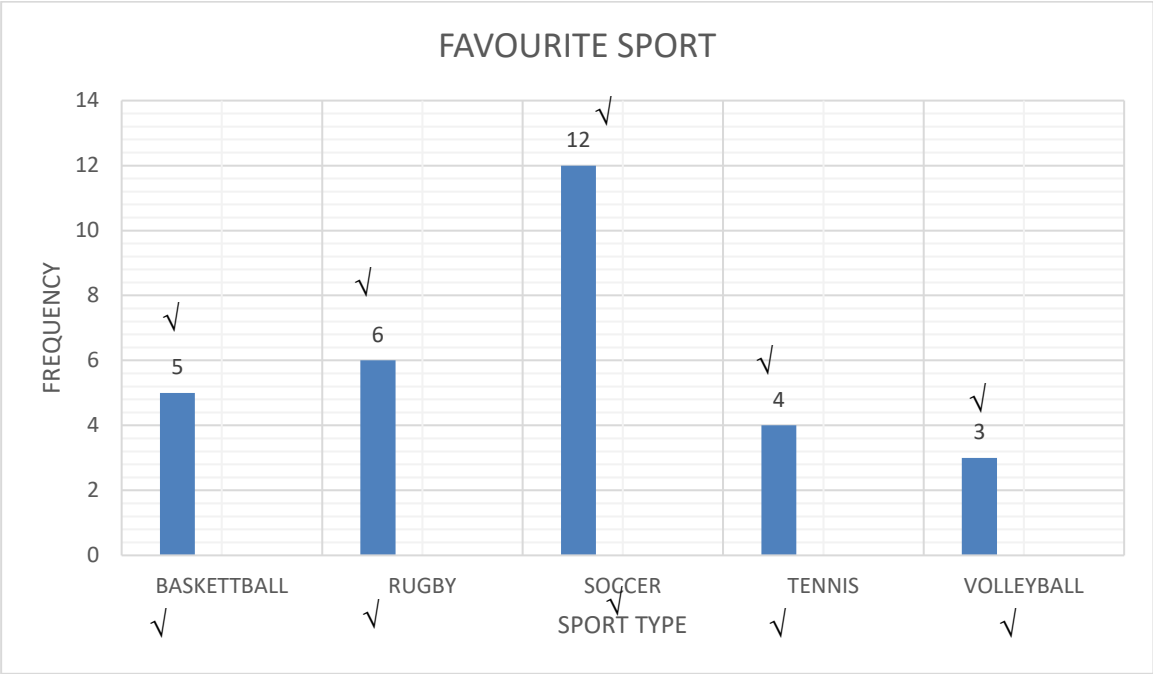
Sport	Frequency	%	Degrees
Basketball	5	16,7 %	60^o ✓
Rugby	6	20 %	72^o ✓
Soccer	12	40 %	144^o ✓
Tennis	4	13,3 %	48^o ✓
Volleyball	3	10%	36^o ✓
TOTAL:	30	100 %	360^o



(5)

(½ for each degree + ½ for each correct sector)

1.2.4



Correct naming or labelling of bars = (½ for each bar + ½ for each label) (5)

1.3 1.3.1 Stem and leaf

Stem	Leaf
6	3; 6; 7; 8 ✓
7	0; 4; 9 ✓
8	2; 4 ✓
9	0;1; 5; 5; 5; 5; 5; 9✓
10	0; 3; 9 ✓

(5)

1.3.2 $Mode = 95$✓✓ (2)

1.3.3 $Median = \frac{90 + 91}{2}$ ✓

$= 90{,}5$✓ (2)

1.3.4 $Range = 109 - 63$

$= 46$✓ (1)

1.4 1.4.1 $Q_{1position} = \frac{1}{4}(n + 1) = \frac{1}{4}(9 + 1) = 2.5$ ✓

$\therefore Q_1 = P_2 + 0{,}5(P_3 - P_2)$

$= 24 + 0{,}5(27 - 24)$

$= 25{,}5$✓ (2)

1.4.2 $Q_{3position} = \frac{3}{4}(n+1) = \frac{3}{4}(9+1) = 7.5$ ✓

$\therefore Q_3 = P_7 + 0{,}5(P_8 - P_7)$

$= 35 + 0{,}5(48 - 35)$

$= 41{,}5$ ✓ (2)

1.4.3 $IQR = Q_3 - Q_1$

$= 41{,}5 - 25{,}5$✓

$= 16$✓ (2)

1.4.4 $Semi\ IQR = \frac{16}{2} = 8$ ✓ (1)

1.4.5 $P_{75th\ position} = \frac{75}{100}(n+1) = \frac{3}{4}(9+1) = 7.5$ ✓

$\therefore P_{75th} = P_7 + 0{,}5(P_8 - P_7)$

$= 35 + 0{,}5(48 - 35)$✓

$= 41{,}5$✓ (3)
[40]

QUESTION 2

2.1 2.1.1 $A = 2\pi rh + 2\pi r^2$

$= 2\pi\left(\frac{3}{2}\right)(8) + 2\pi\left(\frac{3}{2}\right)^2$ ✓

$= 24\pi + 4{,}5\pi$ ✓

$= 28{,}5\pi\ cm^2$ or $89{,}535\ cm^2$ ✓ (3)

2.1.2 $V_{BEAM} = l \times w \times h$
$= 12 \times 8 \times 6$ ✓
$= 576cm^3$ ✓

$V_{CYLINDAR} = \pi r^2 h$
$= \pi \left(\frac{3}{2}\right)^2 \times 8$ ✓

$= \pi \times \frac{9}{4} \times 8$ ✓

$= 18\,\pi\ cm^3$ ✓

$= 56{,}549\ cm^3$

$Total\ volume = 576 + 56{,}549 + 56{,}549$ ✓

$= 689{,}098\ cm^3$ ✓ (7)

2.2 2.2.1 $D_{AC} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$= \sqrt{(3 - (-1))^2 + (5 - 2)^2}$✓

$= \sqrt{(4)^2 + (3)^2}$✓

$= 5$✓ (3)

2.2.2 $D_{BC} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$= \sqrt{(3 - 4)^2 + (5 - 2)^2}$✓

$= \sqrt{(-1)^2 + (3)^2}$✓

$= \sqrt{10}$✓ (3)

2.2.3 $M_{AC} = \left(\frac{x_1+x_2}{2}; \frac{y_1+y_2}{2}\right)$ ✓

$= \left(\frac{-1+3}{2}; \frac{2+5}{2}\right)$ ✓

$= \left(1; \frac{7}{2}\right)$ ✓ (3)

2.2.4 $M = \frac{y_2 - y_1}{x_2 - x_1}$ ✓

$= \frac{5-2}{3-(-1)}$ ✓

$= \frac{3}{4}$ ✓

$\theta = \tan^{-1}\left(\frac{3}{4}\right)$ ✓

$= 36{,}87^o$ ✓ (5)

2.3 2.3.1 (0; 0)✓✓ (2)

2.3.2 (-2; 5)✓✓ (2)

2.3.3 (5; -3)✓✓ (2)

[30]

QUESTION 3

3.1 3.1.1

$x^2 + y^2 = r^2$

$r = \sqrt{(2)^2 + (1)^2}$

$= \sqrt{5}$ ✓

$\sin\theta - \cot\theta = \left(\frac{y}{r}\right) - \left(\frac{x}{y}\right)$

$= \left(\frac{1}{\sqrt{5}}\right) - \left(\frac{2}{1}\right)$ ✓

$= \frac{-10+\sqrt{5}}{5}$✓

(3)

3.1.2 $3cos^2\theta + cosec\,\theta = 3\left(\frac{2}{\sqrt{5}}\right)^2 + \left(\frac{\sqrt{5}}{1}\right)$✓✓

$= \frac{12+5\sqrt{5}}{5}$✓ (3)

3.2 3.2.1 $cos^2 30^o + \sqrt{\tan 45^o} + \sin(60^o + 30^o) = \left(\frac{\sqrt{3}}{2}\right)^2 + 1 + 1$✓

$= \frac{3}{4} + 2$✓

$= \frac{11}{4}\ or\ 2{,}75$✓ (3)

3.2.2 $\sin 45^o \div \cos 45^o$

$\frac{\sin 45^o}{\cos 45^o} = \frac{\frac{1}{\sqrt{2}}}{\frac{1}{\sqrt{2}}}$✓

$= 1$✓ (2)

3.3 3.3.1 $\tan\theta = sin90^o$

$\tan\theta = 1$✓

$\theta = \tan^{-1}(1)$✓

$\theta = 45^o$✓ (3)

3.3.2 $\frac{2}{cosec\ \theta} - 1 = 0$

$2\sin\theta = 1$✓

$\sin\theta = \frac{1}{2}$

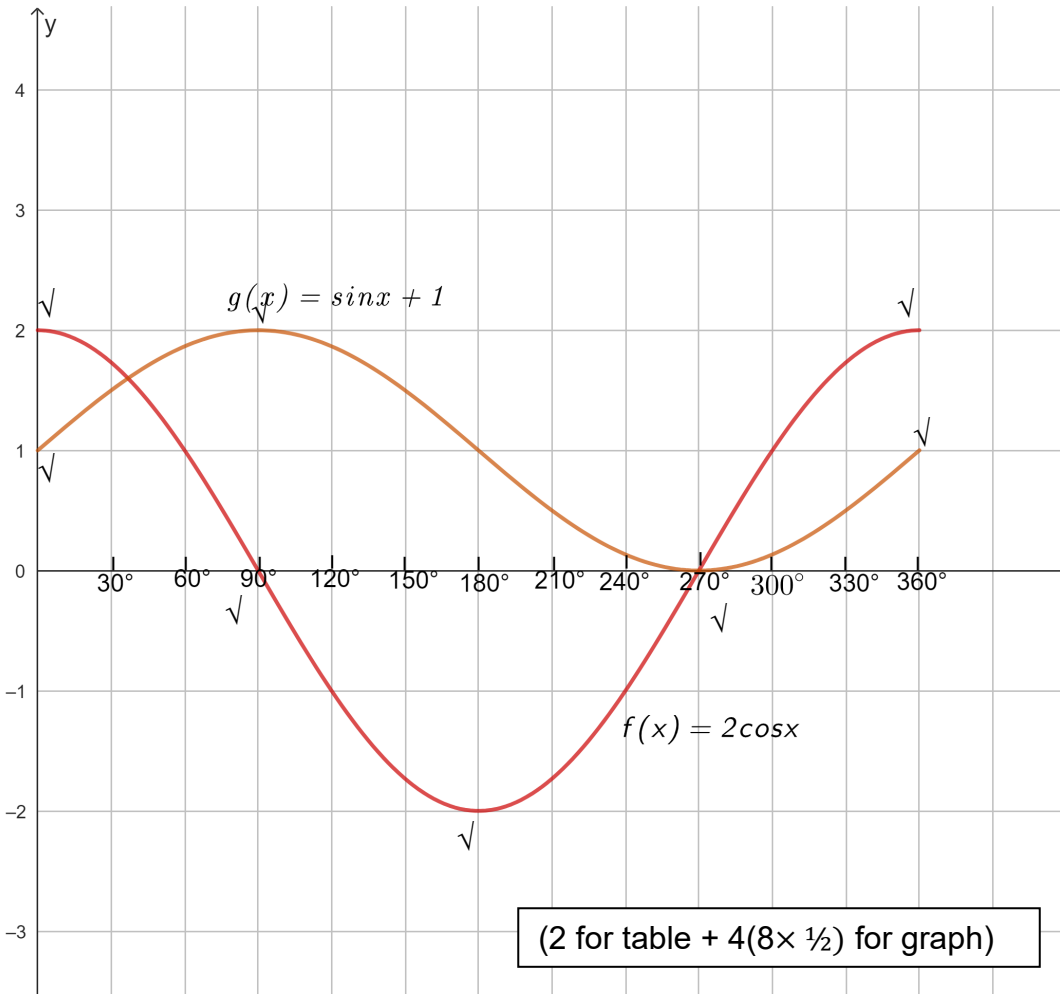
$\theta = \sin^{-1}\left(\frac{1}{2}\right)$✓

$\theta = 30^o$✓ (3)

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3.4 3.4.1

x	0^o	30^o	60^o	90^o	120^o	150^o	180^o	210^o	240^o	270^o	300^o	330^o	360^o
$f(x)$ ✓	2	1,73	1	0	-1	-1,73	-2	-1,73	-1	0	1	1,73	2
$g(x)$ ✓	1	1,5	1,86	2	1,86	1,5	1	0,5	0,13	0	0,13	0,5	1



(2 for table + 4(8× ½) for graph) (6)

3.4.2 2✓ (1)

3.4.3 360° ✓ (1)

3.4.4 Range of $g(x)$: $0 \leq y \leq 2$ ✓ *or* $[0; 2]$ ✓
Domain of $g(x)$: $0° \leq x \leq 360°$ or $[0°; 360°]$ (2)

3.5 $\sin\theta = \frac{y}{r}$

$\sin 30^o = \frac{h}{10}$ ✓

$h = 10\sin 30^o$ ✓

$h = 5m$ ✓

(3)
[30]

TOTAL: 100

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