higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NASIENRIGLYN

NASIONALE SERTIFIKAAT (BEROEPSGERIG)

WISKUNDE
(Tweede vraestel)
NKR VLAK 3

17 Februarie 2025

Hierdie nasienriglyn bestaan uit 8 bladsye.

Kopiereg voorbehou

VRAAG 1

1.1 1.1.1 Posisie van median=9
Mediaan=10,03✓ (1)

1.1.2 Posisie van Q_1=4,5

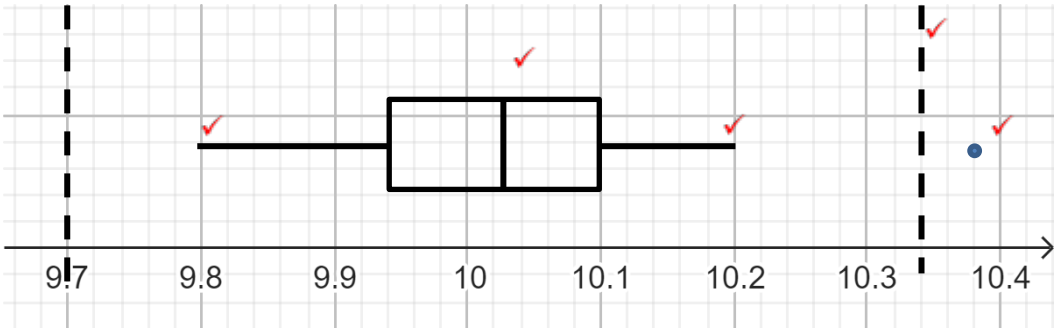
$$\text{Laer kwartiel } Q_1 = \frac{9{,}93 + 9{,}95}{2}$$
$$= 9{,}94\checkmark$$

Posisie van Q_3=13,5

$$\text{Laer kwartiel } Q_3 = \frac{10{,}10 + 10{,}10}{2}$$
$$= 10{,}10\ \checkmark$$ (2)

1.1.3 $\text{Laer perk } = Q_1 - 1{,}5(Q_3 - Q_1)$
$= 9{,}94 - 1{,}5(10{,}10 - 9{,}94)$ ✓
$= 9{,}7$✓
$\text{Boonste perk} = Q_3 + 1{,}5(Q_3 - Q_1)$
$= 10{,}10 + 1{,}5(10{,}10 - 9{,}94)$✓
$= 10{,}34$✓ (4)

1.1.4



1 punt Uitskieter by 10,38
1 punt Perke by 9,7 en 10,34
1 punt Nuwe maksimum by 10,2
1 punt minimum by 9,8
1 punt Houer (Q_1 , Q_2 *en* Q_3) (5)
(5)

1.1.5 10,38✓
Die atleet is beseer of was moeg.
Enige ander toepaslike verklaring waarom 'n atleet tydens oefening stadiger mag hardloop.✓ (2)

1.2 1.2.1

Tyd (minute) (x)	Frekwensie f_i	Middelpunt x_i	$f_i x_i$	< Kumulatiewe frekwensie
$0 \leq x < 20$	$\mathbf{a = 12}$	10	$\mathbf{b = 120}$	$\mathbf{c = 12}$
$20 \leq x < 40$	22 ✓	30	660 ✓	34 ✓
$40 \leq x < 60$	45	50	2 250	$\mathbf{d = 78}$
$60 \leq x < 80$	33	70	2 310	112 ✓
$80 \leq x < 100$	8	90	720 ✓	✓ 120
TOTAAL	$\sum f_i = 120$		$\sum f_i x_i$ (e) = 6 060	

(5)

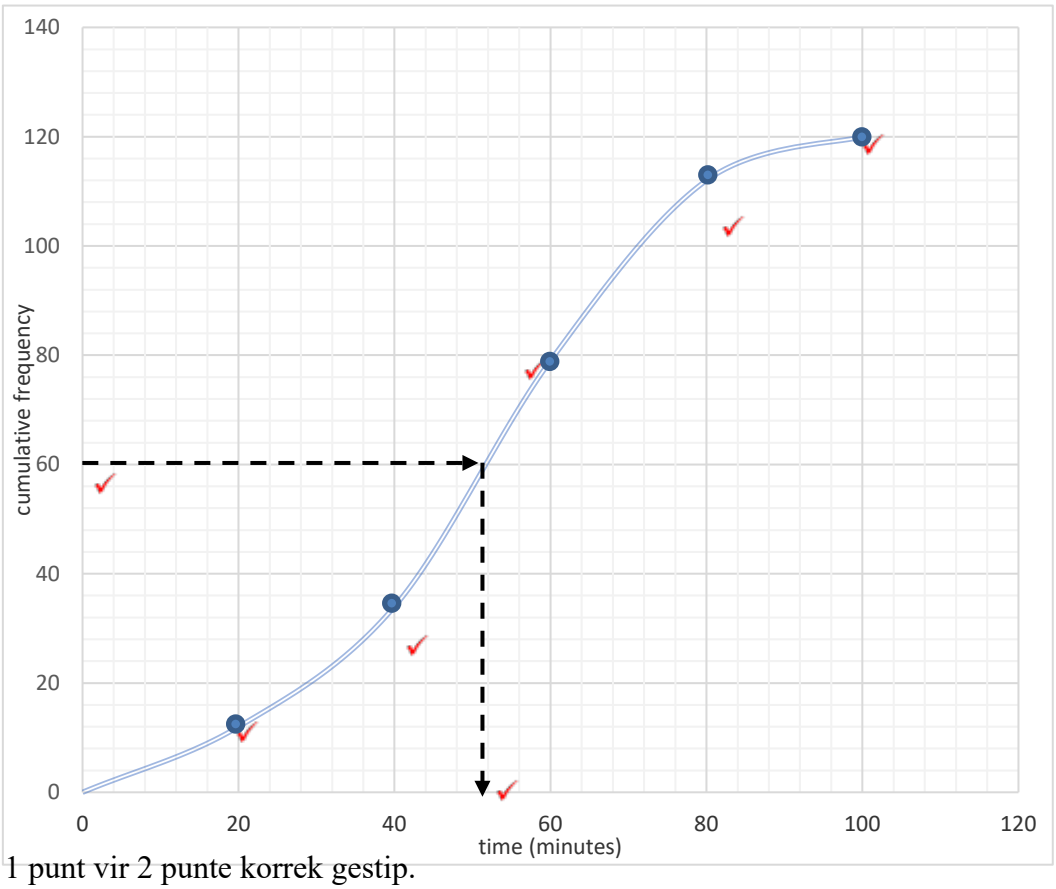
1.2.2 $$\overline{X} = \frac{\sum f_i x_i}{\sum f_i}$$

$$= \frac{6\,060}{120} \checkmark$$

$$= 50{,}5 \checkmark$$

(2)

1.2.3



1 punt vir 2 punte korrek gestip.
1 punt vir die verbinding van punte.
1 punt, algehele indruk, egalige kromme. (5)

1.2.4 2 punte of grafiek
Mediaan= 51
Aanvaar 49 tot 53, soos op die kandidaat se grafiek aangedui is✓ (3)
[29]

VRAAG 2

2.1 2.1.1
$$V_{\text{hemisfeer}} = \frac{1}{2}\left(\frac{4}{3}\pi r^3\right)$$
$$= \frac{1}{2}\left(\frac{4}{3}\pi \times 27^3\right)$$
$$= 41\,223{,}979 \text{ cm}^3$$ (3)

2.1.2
$$V_{\text{keël}} = \frac{1}{3}\pi r^2 h$$
$$= \frac{1}{3}\pi \times (25)^2 \times 24$$
$$= 15\,707{,}963 \text{ cm}^3$$ (3)

2.1.3
$$V_{Lood} = V_{\text{hemisfeer}} - V_{\text{keël}}$$
$$= 41\,223{,}979 - 15\,707{,}963$$
$$= 25\,516{,}106 \text{ cm}^3$$ (2)

2.1.4
$$TA_{keël} = \pi rl$$
$$= \pi \times 25 \times \sqrt{25^2 + 24^2}$$
$$= 2\,721{,}832 \text{ cm}^2$$ (2)

2.1.5 Totale buite-oppervlakte= $Oppervlakte_{geboë\ deel} + Oppevlakte_{sirkel}$
$$= \frac{1}{2}(4\pi \times 27^2) + \pi \times 27^2$$
$$= 6\,870{,}663\ cm^2$$ (3)

2.2 2.2.1
$$m_{AB} = \frac{8-(-6)}{4-(-6)}$$
$$= \frac{7}{5}$$
$$8 = \frac{7}{5}(4) + c$$
$$c = \frac{12}{5}$$
$$y = \frac{7}{5}x + \frac{12}{5}$$

$$y - 8 = \frac{7}{5}(x-4)$$
$$y = \frac{7}{5}x + \frac{12}{5}$$ (3)

2.2.2 $m_{DE} = -\frac{5}{7}$ ✓

$m_{AB} \times m_{DE} = \frac{7}{5} \times -\frac{5}{7}$ ✓

✓ $= -1$ Dus, dit is loodreg. (3)

2.2.3 $y = -\frac{5}{7}x + c$ ✓

$8 = -\frac{5}{7}(4) + c$ ✓

$c = \frac{76}{7}$

$y = -\frac{5}{7}x + \frac{76}{7}$ ✓ (3)

2.2.4 $\theta = \tan^{-1}(m)$

Ref angle $= \tan^{-1}\left(\frac{5}{7}\right)$ ✓

$= 35{,}538^0$

$\theta = 180^0 - 35{,}538^0$ ✓

$= 144{,}462^0$ ✓ (3)

[25]

VRAAG 3

3.1 $\frac{\sin 110^0 . \cos 330^0 . \tan 210^0}{\cos 20^0 . \sin 225^0 . \cos 135^0} = \frac{\sin(90^0 + 20^0).\cos(360^0 - 30^0).\tan(180^0 + 30^0)}{\cos 20^0 . \sin(180^0 + 45^0).\cos(180^0 - 45^0)}$ ✓

$= \frac{\cos 20^0 . \cos 30^0 . \tan 30^0}{\cos 20^0 . -\sin 45^0 . -\cos 45^0}$ ✓ ✓

$= \frac{\cos 30^0 . \tan 30^0}{\sin 45^0 . \cos 45^0}$

$= \frac{\frac{\sqrt{3}}{2} . \frac{\sqrt{3}}{3}}{\frac{\sqrt{2}}{2} . \frac{\sqrt{2}}{2}}$ ✓ ✓

$= \frac{3}{6} \div \frac{1}{2}$

$= 1$ ✓ (6)

3.2 $\frac{\sin^2 k . \sin(90^0 - k)}{\cos(180^0 - k).\sin(360^0 - k).\tan(180^0 + k} = \frac{\sin^2 k . \cos k}{-\cos k . - \sin k . \tan k}$ ✓ ✓

$= \frac{\sin k}{\tan k}$

$= \sin k \div \frac{\sin k}{\cos k}$ ✓

$= \cos k$ ✓ (4)

3.3 3.3.1 $5\tan(x+30^0) = -9$

$\tan(x+30^0) = -\frac{9}{5}$

$ref\ angle = tan^{-1}\left(\frac{9}{5}\right)$

$= 60,945^0$

$x + 30^0 = 180^0 - 60,945^0$ ✓ of $x + 30^0 = 360^0 - 60,945^0$

$x = 89,055^0$ ✓ or $x = 269,055^0$ ✓ (3)

3.3.2 $3sin^2x - 2 = 0$

$\sin x = \pm\frac{\sqrt{6}}{3}$

$ref\ angle = sin^{-1}\left(\frac{\sqrt{6}}{3}\right)$

$= 54,736^o$ ✓

$\sin x = \frac{\sqrt{6}}{3}$ $\qquad$ $\sin x = -\frac{\sqrt{6}}{3}$

$x = 54,736^o; 125,264^o$ ✓ $\qquad$ $x = 234,736; 305,264$ ✓ (5)

3.4 3.4.1 $q^2 = p^2 + r^2 - 2\text{prCosQ}$

$q^2 = 14^2 + 12,5^2 - 2(14)(12,5)\text{Cos}50^o$ ✓✓

$= 127,274335$ ....

$PR = 11,282$ km ✓ (3)

3.4.2 $\frac{\text{p}}{\sin \text{P}} = \frac{\text{s}}{\sin \text{S}}$

$\frac{\text{p}}{\sin 85^o} = \frac{11,282}{\sin 55^o}$ ✓ C.A vanaf 3.4.1

$\text{p} = \frac{11,282}{\sin 55^o}.\sin 85^o$ ✓

$= 13,720\ km$ ✓ (3)

3.4.3 $\text{Oppervlakte} = \frac{1}{2}\text{rp.sinQ}$

$= \frac{1}{2} \times 14 \times 12,5.\sin 50^0$ ✓

$= 67,029\ km^2$ ✓ (2)

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VRAAG 4

4.1 4.1.1 Borgskap: Geld wat deur 'n maatskappy of 'n individue geskenk word om gebeure of aktiwiteite van 'n klub te ondersteun.

4.1.2 Fondsinsamelingsfunksie: 'n Funksie wat deur 'n klub aangebied word waar lede en ander mense uitgenooi word om aan aktiwiteite deel te neem om geld vir die klub in te samel.

(2 × 1) (2)

4.2 4.2.1 A − 6 450
B: 24 050
C: 1 200
D: 1 000
E: 200
F: 18 700 (6)

4.2.2 Donasies of
Aanbieding van toernooie (1)

4.3 $A = P\left(1 + \frac{r}{100m}\right)^{t \times m}$

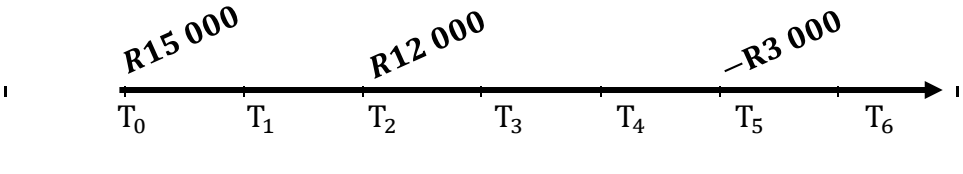
$45\,563{,}70 = 30\,000\left(1 + \frac{r}{12 \times 100}\right)^{12 \times 3{,}5}$ ✓

$\frac{r}{1200} = \sqrt[42]{\frac{45\,563{,}70}{30\,000}} - 1$ ✓

$r = 1\,200\left(\sqrt[42]{\frac{45\,563{,}70}{30\,000}} - 1\right)$ ✓

$r = 12$ ✓ (3)

4.4 4.4.1



✓ ✓ ✓ (3)

4.4.2 $A_2 = 15\,000\left(1 + \frac{14}{100} \times 2\right)$ ✓

$= R19\,200$ ✓

$A_3 = 31\,200\left(1 + \frac{14}{100} \times 1\right)$ ✓

$= R35\,568$

$A_5 = 35\,568\left(1 + \frac{9}{100}\right)^2$

$= R42\,258{,}3408$ ✓

$A_6 = 39\,258{,}3408\left(1 + \frac{9}{100} \times 1\right)$ ✓

$= \text{R}42\,791{,}59$ ✓ (5)

[20]

TOTAAL: 100

Kopiereg voorbehou