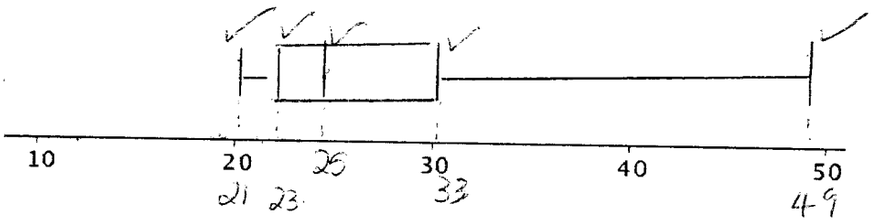
Gr 12 Wiskunde V2
Memorandum

1.1



5)

min ✓
Maks ✓
Q_1 ✓
Med ✓
Q_3 ✓

1.2 Skeef na regs / positief skeef ✓ (1)

cntw ✓

1.3 $33 + 10 \times 1,5$ ✓
$= 48$ ∴ uitskieters ✓ (3)

✓ IKV = 7,5
✓ formule subst
✓ cntw

1.4 5,9 ✓✓ (3)

cntw ✓✓

1.5.1 Sal nuut ↗ styg ✓ (1)

cntw ✓

1.5.2 Sal dieselfde bly ✓ (1)

cntw ✓

[14]

2. $\frac{30 \times 45 + 50 \times 58 + 70 \times 32 + 90 \times 9 + 110 \times 3}{150}$ ✓ ✓

$= \frac{7120}{150} = R\,51,47$ ✓ (3)

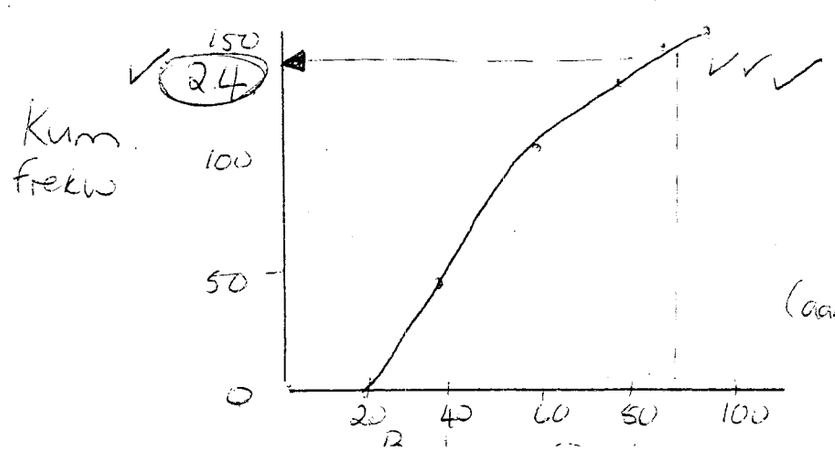
totaal ✓
÷ 150 ✓
cntw

Bedrag spandeer | Aantal | Kum. frek.

20 → 40	48	48
40 → 60	58	106
60 — 80	32	138
80 → 100	9	147
100 → 120	3	150

✓✓✓ (-1) fout (3)

✓✓✓ kf



✓ ✓✓✓ (3)

glad kurwe ✓
grense by 20
punte ✓

24 ± 6 (aanvaar 3 - 9)

wys op ✓ as
cntw ✓

[14]

31. $PS = \sqrt{(0-10)^2+(4+1)^2}$ ✓
$= \sqrt{125}$
$= 5\sqrt{5}$ $(11,18)$ ✓ (2)

32. $m_{PQ} = \frac{4+2}{0+6} = 1$ ✓ (2)

33. $y = x+c$ $(m = 1$ gram$)$
$(15;-1)$ $-1 = 10+c$ ✓
$-11 = c$
$y = x-11$ ✓ (3)

34. $R(a;b)$ ✓ ✓ (2)

35. $\tan\theta = 1$
$\theta = 45°$ ✓
$\tan\alpha = -\frac{5}{10} = -\frac{1}{2}$ ✓
$\alpha = 180 - 26,57°$ ✓
$= 153,43°$

* $\angle QPS = 153,43 - 45°$ (buite $\angle$ Δ)
$= 108,4°$ ✓
$\angle QRS = 108,4°$ (teenoorst. $\angle$s ll gl)(5)

36. $PQ = \sqrt{(0+6)^2+(4+2)^2}$ ✓
$= 6\sqrt{2}$ ✓
$Opp = \frac{1}{2}(6\sqrt{2})(5\sqrt{5})\sin 108,43°$ ✓
$= 45$ eenhede^2 ✓ (4)
[18]

→ * ook: $m_{QR} = \frac{-5}{10} = -\frac{1}{2}$

$\tan\angle_1 = 180° - 26,57° = 153,43°$

$m_{SR} = 1$
$\tan\angle_2 = 1$
$153,43 - 45°$
$= 108,43°$

Subst ✓
antw ✓
Subst ✓
c, antw ✓
$m = 1$ ✓
subst $(10;-1)$ ✓
vgl ✓
$a = 4$ ✓ $b = -7$ ✓
$\theta = 45°$
$\tan\alpha = -\frac{1}{2}$ ✓
$\alpha = 153,43°$
$\angle QPS$ ✓
$\angle QRS$ ✓
PQ subst ✓
PQ lengte ✓
✓ subst sin-form
✓ antw.

4.1 $m = \frac{5-1}{-4-4} = \frac{4}{-8} = -\frac{1}{2}$ ✓

$y = -\frac{1}{2}x + c$

$(4;1)$ $1 = -\frac{1}{2}(4) + c$ of $(-4;5)$

$1 = -2 + c$

$3 = c$ ✓ (2)

$y = -\frac{1}{2}x + 3$

m ✓ $= -\frac{1}{2}$

c ✓ $= 3$

4.2 $y = 2x + c$ (MF)

$(-1;-4)$ $-4 = 2(-1) + c$

$-2 = c$ ✓ (2)

$y = 2x - 2$

m ✓ $= 2$

c $= -2$

4.3 $-\frac{1}{2}x + 3 = 2x - 2$ ✓

$-x + 6 = 4x - 4$

$-5x = -10$

$x = 2$ ✓

$y = 2$ ✓ $(2;2)$ (3)

vgl $=$ ✓

$x = 2$ ✓

$y = 2$ ✓

4.4 $(5; 8)$ (MF) (2)

(MF 4.2)

(5 ✓ ; 8 ✓)

(-1) nie koördinaat

4.5 X-afsnit CD: $2x - 2 = 0$ ✓

$x = \frac{2}{2} = 1$ $(1;0)$

x-afsnit ✓

hoogtelyn: $m_{BC} = \frac{1+4}{4+1} = 1$ ✓

m_{BC} ✓

$m_{hoogtelyn} = -1$ ✓

m hoogtelyn ✓

$y = -x + c$

$(-4;5)$ $5 = -(-4) + c$

$1 = c$

$y = -x + 1$ ✓

$y = x + 1$ ✓

$(1;0)$ $y = -1 + 1 = 0$ ✓ ∴ Ja ✓ (6)

subst ✓ gevolgtr. ✓

Vraag 5

5.1 $$\frac{\sin(450^\circ - x)\tan(x - 180^\circ)\sin 23\cos 23^\circ}{\cos 44^\circ \cdot \sin(-x)}$$

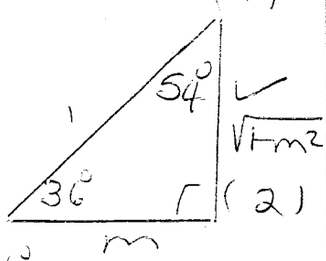
$$= \frac{\cos x \cdot \tan x \cdot 2\sin 23\cos 23}{2\cos 44^\circ \cdot -\sin x}$$

$$= \frac{\cos x \cdot \frac{\sin x}{\cos x} \cdot \sin 46^\circ}{2\sin 46^\circ \cdot -\sin x}$$

$$= -\frac{1}{2}$$ (7)

$\cos x \cdot \tan x$
$-\sin x$
$\frac{\sin x}{\cos x} \cdot \sin 46^\circ$
$\cos 44 = \sin 46$
$-\frac{1}{2}$

5.2.1 $\cos 36^\circ = m$
$\sin 36^\circ = \sqrt{1-m^2}$



(2)

Skets
$\sin 36^\circ$

5.2.2 $\sin 18^\circ \cdot \cos 18^\circ - \sin(-54^\circ)\tan 216^\circ$

$= \frac{1}{2}\sin 36^\circ + \sin 54^\circ \tan 36^\circ$

$= \frac{1}{2}\sqrt{1-m^2} + m \cdot \frac{\sqrt{1-m^2}}{m}$

$= \frac{3\sqrt{1-m^2}}{2}$ (6)

$\frac{1}{2}\sin 36^\circ$
$+ \sin 54 \tan 36^\circ$
Subst -1 - fout
$1\frac{1}{2}\sqrt{1-m^2}$

5.3.1 LK $\frac{\cos x - \sin x \sin 2x}{\cos 2x}$

$= \frac{\cos x - 2\sin x \cos x \sin x}{\cos 2x}$

$= \frac{\cos x(1 - 2\sin x)}{(1 - 2\sin x)}$

$= \cos x = RK$ (3)

$\sin 2x$ uitbreiding
faktoriseer
$\cos 2x$ uitbreiding

5.3.2 $\cos 2x = 0$
$2x = 90^\circ + 360^\circ n$ of $2x = 270^\circ + 360^\circ n$
$x = 45^\circ + 180^\circ n$ $x = 135^\circ + 180^\circ n$, $n \in Z$ (2)

2 waardes
(nie alg gpl)

54 $2\sin^2(\theta - 45) + \sin 2\theta$

$= 2\left[\sin\theta.\cos 45^\circ - \cos\theta.\sin 45^\circ\right]^2 + 2\sin\theta\cos\theta$ ✓ ✓ ✓ ✓ ✓ uitbreiding $\sin 2\theta$ ✓ uitbreiding $\sin(\theta - 45^\circ)$ ✓

$= 2\left[\sin\theta.\left(\frac{\sqrt{2}}{2}\right) - \cos\theta.\left(\frac{\sqrt{2}}{2}\right)\right]^2 + 2\sin\theta.\cos\theta$ ✓ spes. $\frac{\sqrt{2}}{2}$ ✓ $2[\ ]^2$ ✓ vereenvoudig

$= 2\left[\frac{1}{2}\sin^2\theta - \sin\theta\cos\theta + \frac{1}{2}\cos^2\theta\right] + 2\sin\theta.\cos\theta$ ✓

$= \sin^2\theta + \cos^2\theta - 2\sin\theta\cos\theta + 2\sin\theta.\cos\theta$ ✓ $\sin^2\theta + \cos^2\theta = 1$

$= 1$ (5)

55. $-1 \leq \cos x \leq 1$ ✓ ✓ $r = \cos x$ ✓

$\therefore x \in R, x \neq 0, 360^\circ, 180^\circ$ ✓ (3) $-1 \leq r \leq 1$ ✓ ✓ $\sin + \cos$ ✓

56. $PS^2 = m^2 + (2m)^2 - 2m(2m)\cos\alpha$ ✓ cos-formule ✓

$= m^2 + 4m^2 - 4m^2\cos\alpha$

$= 5m^2 - 4m^2\cos\alpha$ ✓ vereenvoudig ✓

$= m^2(5 - 4\cos\alpha)$ ✓ faktoriseer ✓

$PS = m\sqrt{5 - 4\cos\alpha}$ ✓ $\sqrt{PS^2}$ ✓

$\sin\beta = \frac{SR}{PS}$ ✓ (of $\frac{PS}{\sin\theta} = \frac{SR}{\sin\beta}$) $\sin\beta$ ✓

$SR = PS\sin\beta$ ✓ subst ✓

$= m\sqrt{5 - 4\cos\alpha}.\sin\beta$ (6)

[34]

6.1. $\cos 2x = -\sin x$

✓ $1 - 2\sin^2 x + \sin x = 0$

$2\sin^2 x - \sin x - 1 = 0$ ✓

$(2\sin x + 1)(\sin x - 1) = 0$ ✓

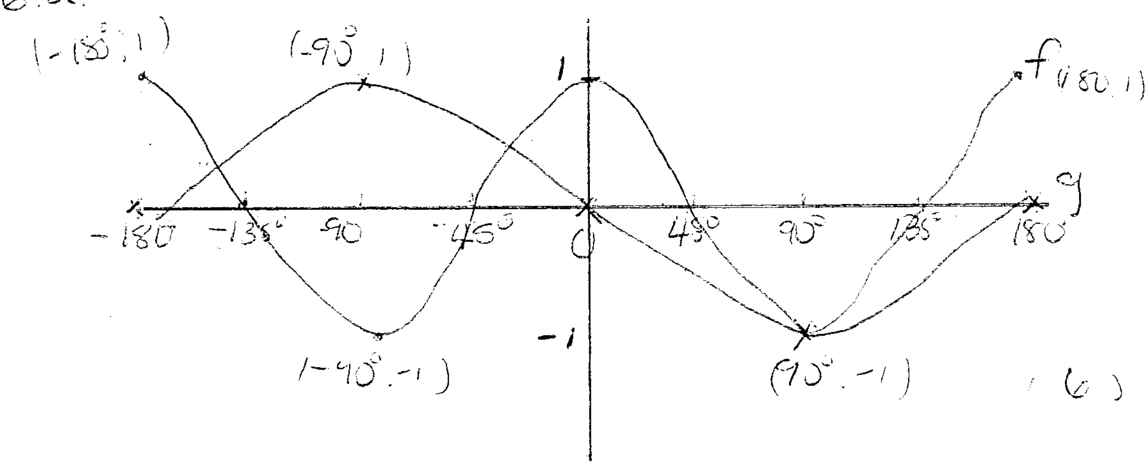
$\sin x = -\frac{1}{2}$ of $\sin x = 1$ ✓

Verw $\angle = 30^\circ$

3de	4de
$x = 180^\circ + 30^\circ + 360^\circ n$	$x = 360^\circ - 30^\circ + 360^\circ n$
$x = 210^\circ + 360^\circ n$ ✓	$= 330^\circ + 360^\circ n$, $n \in Z$ ✓

∴ $x = -150^\circ; -30^\circ; 90^\circ$ ✓ ✓ (8)

6.2.



(6)

6.3 $p = 180^\circ$ ✓ (1)

6.4.1 $-150^\circ \leq x \leq -30^\circ$ of $x = 90^\circ$ ✓ ✓ ✓ (3)

6.4.2 -2 ✓ ✓ (by $x = -90^\circ$) → $[\cos 2x - (-\sin x)]$ (2)

6.5 $\cos^2 x < \sin^2 x$

$\cos^2 x - \sin^2 x < 0$

$\cos 2x < 0$

✓ $45^\circ < x < 135^\circ$ ✓ (2)

6.6 $y = \sin x - 1$ ✓ ✓ (2)

[24]

cos 2x ✓
S.V ✓
faktore ✓
sin x ✓
3de ✓
4de ✓
$-150^\circ; -30^\circ$ ✓
90° ✓
f: draaipunte
x-afsnitte ✓
y-afsnit ✓
g: draaipunte ✓
x-afsnitte ✓
y-afsnitte ✓
180° ✓
$-150^\circ \leq x$ ✓
$x \leq -30^\circ$ ✓
$x = 90^\circ$ ✓
✓✓ antw (-1) N.
$\sin x$ ✓ -1 ✓
✓ $45^\circ < x < 135^\circ$ ✓

7.1 Konstr: OE en OF ✓

Bewys:

Gestel $\angle D = x$

$\therefore \angle O = 2x$ ✓ (middelpts $\angle$ = 2 × omtreks $\angle$) ✓

$\angle E_2 = \angle F_1$ ✓ (gelyke $\angle$e teenoor gelyke sye, radiusse)

$= 90 - x$ (som v. $\angle$e Δ)

$\therefore \angle E_1 = \angle C = x$ ✓ (radius ⊥ raaklyn) (7)

Konstr ✓

$\angle D = x$ ✓

$\angle O = 2x$

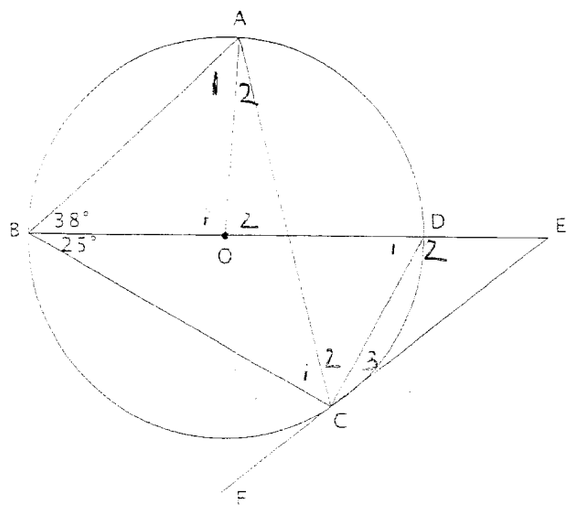
rede ✓

$\angle E_2 = \angle F_1$ ✓

rede ✓

$\angle E_1 = \angle C$ ✓

rede ✓



7.2.1. $\angle 1\ A_1 = 38°$ (gelyke $\angle$e teenoor gelyke sye) ✓ (buite $\angle$ Δ)

7.2.2 $\angle O_2 = 76°$ (midpts $\angle$ = 2 × omtreks $\angle$) ✓

7.2.3 $\angle C_2 = 38°$ (onderspan deur AD) ✓ midpts $\angle$

7.2.4 $\angle C_1 = 52°$ ($\angle$ in semi-sirkel) ✓

7.2.5 $\angle C_{2+3} = 63°$ ($\angle$ tussen raaklyn en koord) ✓ (5)

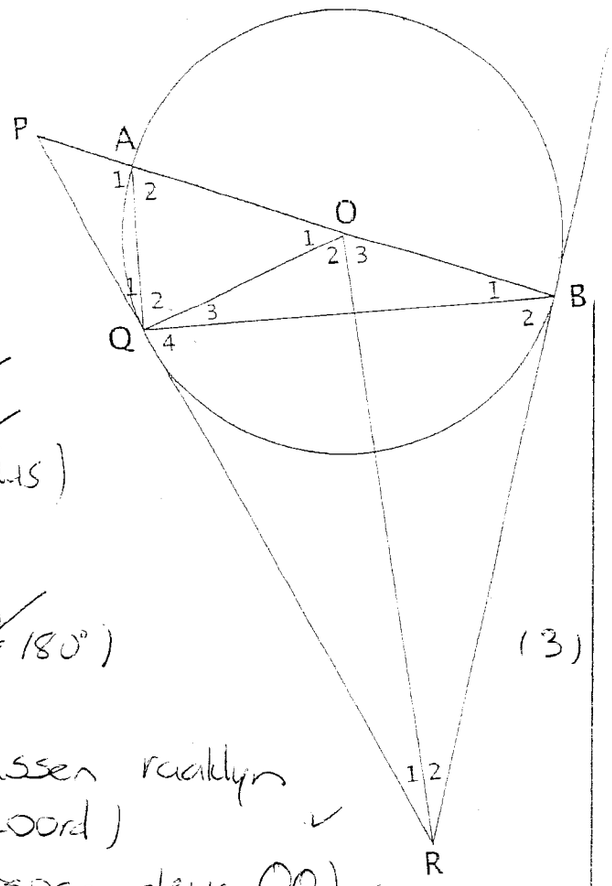
7.2.2 $52°$ ✓ ($\angle$ in semi-sirkel) ✓ (2)

elke $\angle$ trede ✓ ✓ ✓ ✓ ✓

52° ✓

rede ✓

[14]



8.1.1 $\angle Q_{3+4} = \angle B_{1+2}$ ✓

$= 90°$ ✓

(raaklyn $\perp$ radius) ✓

$\therefore$ RBOQ is kvh ✓

(teenoorst. $\angle = 180°$)

(3)

$\angle Q_{3+4} = \angle B_{1+2} = 90°$ ✓

rede ✓

rede kvh ✓

8.1.2 $\angle B_1 = x$ ($\angle$ tussen raaklyn en koord) ✓

$\angle R_1 = x$ (onderspan deur OQ) ✓

$\angle Q_3 = x$ (gelyke $\angle$e teenoor gelyke sye) ✓

$\angle R_2 = x$ (onderspan deur OB) ✓ (4)

4 $\angle$e + rede ✓✓✓✓

8.1.3 $\angle Q_2 = 90° - x$ ✓ (radius $\perp$ raaklyn)

$\angle A_2 = 90 - x$ ✓ (gelyke $\angle$e teenoor gelykesye)

$\therefore \angle P = 90 - x - x$ (SomHoek $\triangle$)

$= 90 - 2x$ ✓

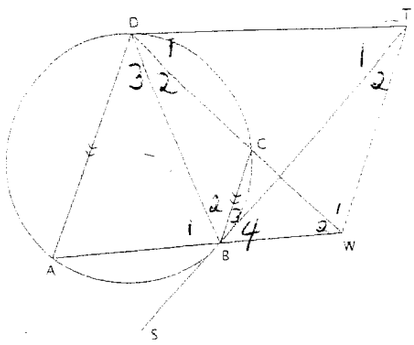
(3)

$\angle Q_2$ + rede ✓

$\angle A_2$ + rede ✓

$\angle P = 90 - 2x$ ✓

8.2



8.2.1 $\angle D_1 = \angle B_2$ (tussen ✓ raaklyn en koord) $\angle D_1 = \angle C_2$ + rede ✓
$= \angle B_4$ (gegee)
$\therefore \angle D_1 = \angle B_4$ ✓ $\angle D_1 = \angle B_4$ ✓
BWTD is 'n kvh (koord ✓ onderspan gelyke $\angle$e) (3) kvh rede ✓

8.2.2 $\angle B_2 = \angle D_3$ (VSW ✓ $\angle$e AD // BC) $\angle B_2 = \angle D_3$ + rede ✓
$= \angle B_4$ (gegee) ✓ $= \angle B_4$ ✓

Maar $\angle D_{3+2} = \angle B_{3+4}$ (buite ✓ $\angle$ kvh) $\angle D_{3+2} = \angle C_{3+4}$ + rede ✓

$\therefore \angle D_2 = \angle B_3$ ✓ $\angle D_2 = \angle C_3$ ✓
TBS is raaklyn ($\angle$ tussen ✓ raaklyn en koord) (5) kvh rede ✓
(Kan ook bewys $\angle B_{3+4} = \angle A$)

8.2.3 $\angle D_2 = \angle C_3$ (Creeds bewys) ✓ $\angle D_2 = \angle C_3$
$= \angle T_2$ (onderspan DT) ✓ $= \angle T_2$ + rede ✓
$\therefore$ TW // BC (VSW $\angle$e $C_3 = T_2$ gelyk) ✓ rede ✓
(2)

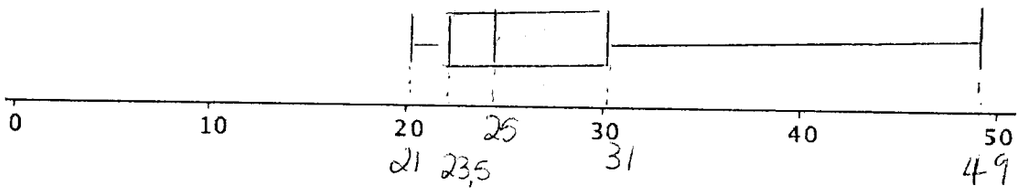
[20]

DIAGRAMVEL : GRAAD 12 WISKUNDE VRAESTEL 2 JUNIE 2016

NAAM : Memo

HEG AGTER AAN ANTWOORDSTEL

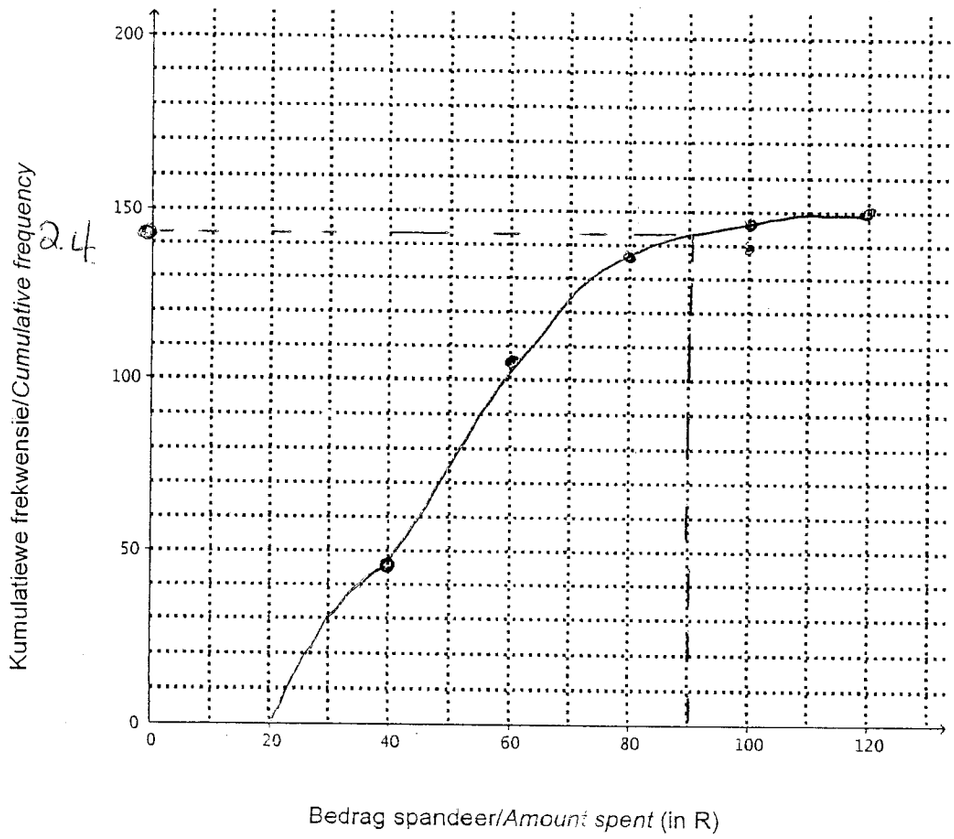
Vraag/Question 1.1



Vraag/Question 2.2

Bedrag spandeer op lugtyd (Rand) *Amount spent on airtime (Rand)*	Aantal tieners *Number of teenagers*	Kumulatiewe frekwensie *Cumulative frequency*
20 tot minder as 40 *20 to less than 40*	48	48
40 tot minder as 60 *40 to less than 60*	58	106
60 tot minder as 80 *60 to less than 80*	32	138
80 tot minder as 100 *80 to less than 100*	9	147
100 tot minder as 120 *100 to less than 120*	3	150

Vraag/Question 2.3



✓ gladde kurwe
✓ geanker by 20
✓ punte korrek

Vraag 6/*Question 6*