Gr 11 Wiskunde V2
November 2015

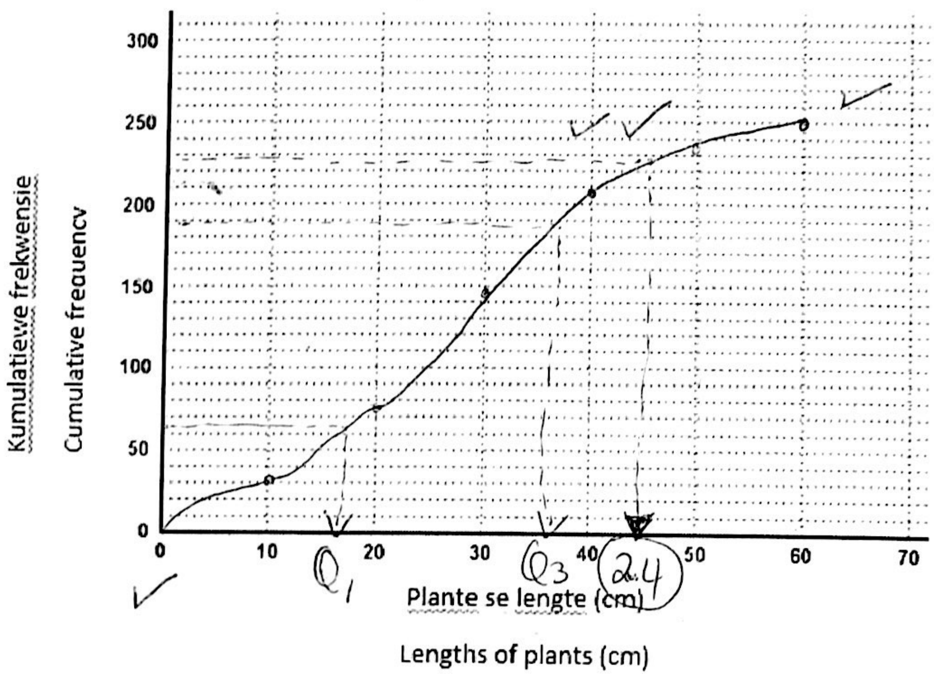
1.1.1 24,34 ✓✓ (2) | 24,34 ✓✓

1.1.2 11,84 ✓✓ (2) | 11,84 ✓✓

1.1.3 24,34 + 11,84 = ~~48,02~~ 36,18 ✓
24,34 − 11,84 = ~~0,66~~ 12,5 ✓
∴ ~~geen~~ 4 lande ✓ (3) | grense ✓✓ geen ✓
[7]

2.1 (a) 31 (b) 77 (c) 149 (d) 212 (e) 234
(f) 250 ✓✓ (2) | ✓✓ (−1 fout)

2.2

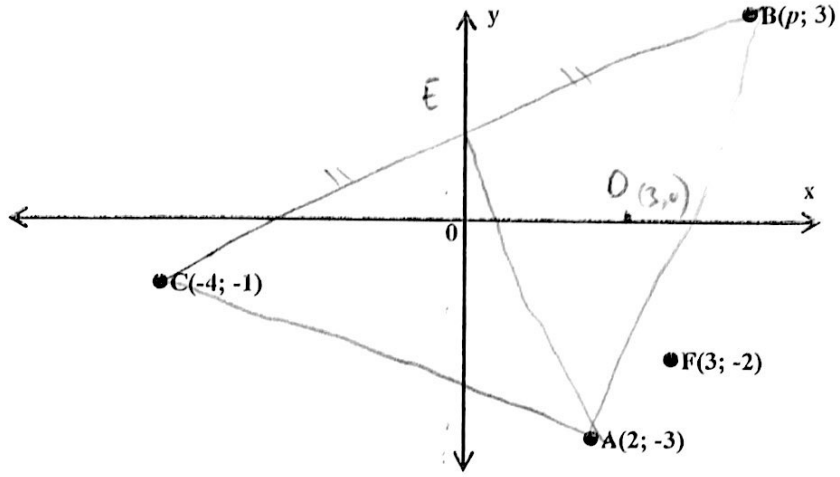


(4) | geanker ✓ boonste punt punte ✓ gladde ✓ kurwe

2.3 $Q_3 \rightarrow 38$ ✓ (36 − 39) $Q_1 = 17$ ✓ (16 − 18) IKV = 21 ✓ mf (3) | Q_1 ✓ Q_3 ✓ IKV ✓

2.4 0,9 × 250 = 225 ✓ (aflees)
∴ 45 cm ✓ (44 − 46) (2) | aflees ✓ antw ✓
[11]

Vraag 3



3.1 $m_{BC} = \frac{3+1}{p+4} = \frac{1}{2}$ ✓

$8 = p + 4$

$4 = p$ ✓

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

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

$c = 1$

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

$3 = \frac{1}{2}p + 1$

$2 = \frac{1}{2}p$

$p = 4$. (2)

subst form ✓ p ✓

3.2 $T(-1; -2)$ ✓ ✓ (2)

x ✓ y ✓

3.3 Mpunt BC $(0; 1)$ ✓ ✓

$m_{AT} = \frac{-3-1}{2-0} = -2$ ✓

$y = -2x + c$

(2; -3) $-3 = -2(2) + c$

$1 = c$

$y = -2x + 1$ ✓ As vir vasted (5)

Midpunt ✓ m ✓ Subst ✓ Vgl ✓

3.4 $m_{AB} = \frac{-3-3}{2-4} = \frac{-6}{-2} = 3$ ✓

$m_{BO} = \frac{3-0}{4-3} = 3$ ✓

∴ kolinêr $m_{AB} = m_{BO}$ ✓

$m_{AD} = \frac{-3-0}{2-3}$

$= 3$. (3)

m_{AB} ✓ m_{BO} ✓ gevolgtrekking

3.5 $y = 2x + 6$

LK -1 ✓

RK $= 2(-4) + 6$ ✓ gevolgtrek ✓1

$= -2$

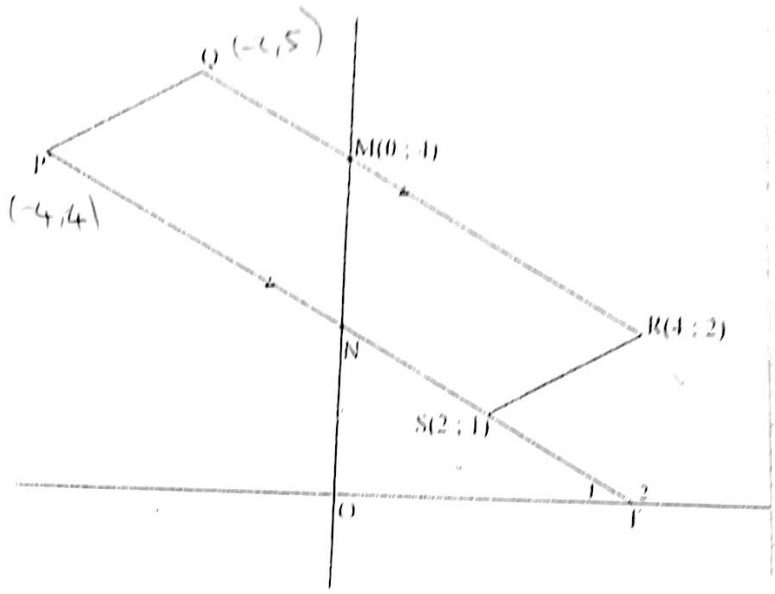
LK $\neq$ RK

∴ punt lê nie op lyn. ✓ (3)

Subst y ✓ Subst x ✓ gevolgtr. ✓

TOTAAL: 15

Vraag 4



4.1 $m_{PS} = \frac{2-1}{4-2} = \frac{1}{2}$ ✓ (2)

Subst. form ✓
antw ✓

4.2 $2y = x + 12$
$y = \frac{1}{2}x + 6$
$m_{RS} = m_{PQ}$ RS // QP
// gram (2 pr. t.o.s sye //)
$PQ = RS = \sqrt{(4-2)^2 + (2-1)^2}$ ✓
$= \sqrt{5}$ ✓ (2,24) (4)

St.vorm ✓
parallelogr. in rede ✓
subst ✓
antw ✓

4.3 $m_{PT} = m_{MR} = \frac{4-2}{0-4} = \frac{2}{-4} = -\frac{1}{2}$ ✓
$y = -\frac{1}{2}x + c$ Mag nie aanvaar $(m = -\frac{1}{2})$.
(2;1) $1 = -\frac{1}{2}(2) + c$ ✓ ✓ mf $(\frac{c}{x})$.
$1 = -1 + c$
$c = 2$ $y = -\frac{1}{2}x + 2$. ✓ (4)

$m = m$ ✓
$m = -\frac{1}{2}$ ✓
subst (2;1) ✓
vgl ✓

4.4 (0; 2) ✓ ✓ (2)

x ✓ y ✓

4.5 $\angle RNS = \angle T_1$ (ver ✓ le lyne //)
$\tan \angle T_2 = -\frac{1}{2}$ ✓
$\angle T_2 = 180° - 26,57$
$= 153,43°$ ✓
$\therefore T_1 = 26,57°$ ✓
$26,6$ (4)

[16]

Stelling ✓
$\tan\theta = \frac{-1}{2}$ ✓
$\angle T_2$ ✓
$\angle T_1$ ✓

5.1 $\frac{\cos(180-x)\sin(x-90^\circ)-1}{\tan^2(540-x).\sin(90^\circ+x).\cos(-x)}$

$= \frac{-\cos x \cdot -\cos^2 x - 1}{(-\tan x)^2 . \cos x \cos x}$

$= \frac{\cos^2 x - 1}{\frac{\sin^2 x}{\cos^2 x} . \cos^2 x}$

$= \frac{-\sin^2 x}{\sin^2 x} = -1$ (8)

$-\cos x$ ✓
$-\cos x$ ✓
$(-\tan x)^2$ ✓
$\cos x$ ✓
$\cos x$ ✓
$\frac{\sin x}{\cos x}$ ✓
$\sin^2 x$ ✓
-1 ✓

5.2 LK: $2 - \cos^2 x(2 + \tan^2 x)$

$= 2 - \cos^2 x\left(2 + \frac{\sin^2 x}{\cos^2 x}\right)$

$= 2 - 2\cos^2 x - \sin^2 x$

$= 2(1 - \cos^2 x) - \sin^2 x$

$= 2(\sin^2 x) - \sin^2 x$

$= \sin^2 x = RK$

If
$2 - 2\cos^2 x - (1 - \cos^2 x)$
$2 - 2\cos^2 x - 1 + \cos^2 x$
$= 1 - \cos^2 x$
$= \sin^2 x$ (4)

$\frac{\sin x}{\cos x}$ ✓
$1 - \cos^2 x$ ✓
$\sin^2 x$ ✓
ontw ✓

5.3 $\sin\theta = 0$ $\cos\theta = -1$

$0^\circ + 360^\circ n$ $180^\circ + 360^\circ n$

$180^\circ + 360^\circ n$

$-180^\circ, 0^\circ, 180^\circ$ (3)

-180° ✓
0 ✓
180° ✓

5.4 $6\cos x - 4 = \frac{2}{\cos x}$

$(\times \cos x)$ $6\cos^2 x - 4\cos x - 2 = 0$

$3\cos^2 x - 2\cos x - 1 = 0$ ✓

$(3\cos x + 1)(\cos x - 1) = 0$ ✓

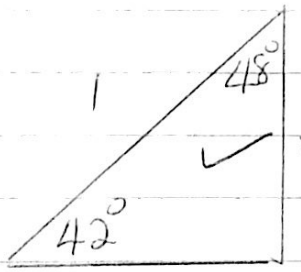
$\cos x = -\frac{1}{3}$ of $\cos x = 1$ ✓

Verw $\angle = 70,53$ (6)

$x = 109,47 + 360^\circ n, 250,53 + 360^\circ n, 0^\circ + 360^\circ n, n \in Z$

St. vorm ✓
faktore ✓
$\cos x =$ ✓
3 antwo ✓✓✓

55 $\sin 42^\circ = \sqrt{1-p^2}$



sketch ✓

$\tan 135^\circ + \tan^2 138 + \frac{\sin 168}{\cos 78^\circ}$

AS + ✓

$-\tan 45^\circ + (-\tan 42^\circ)^2 + \frac{\sin 12}{\cos 78^\circ}$ ✓

Net-1; per point

$= -1 + \left(\frac{\sqrt{1-p^2}}{p}\right)^2 + \frac{\cos 78^\circ}{\cos 78^\circ}$ ✓

$= -1 + \frac{1-p^2}{p^2} + 1$ ✓

$= \frac{1-p^2}{p^2}$ ✓ (7)

$-\tan 45^\circ$ ✓

$(-\tan 42^\circ)^2$ ✓

$\sin 12$ ✓

$\left(\frac{\sqrt{1-p^2}}{p}\right)$ ✓

$\cos 78^\circ$ ✓

ans ✓

56 $\sqrt{14} = \sqrt{(\cos\theta - 2)^2 + (\sin\theta - 3)^2}$ ✓

subst ✓ of st fo

$14 = \cos^2\theta - 4\cos\theta + 4 + \sin^2\theta - 6\sin\theta + 9$ ✓

$14 = 1 - 4\cos\theta + 4 - 6\sin\theta + 9$

$6\sin\theta = -4\cos\theta$ ✓

$\frac{\sin\theta}{\cos\theta} = -\frac{4}{6}$

$\tan\theta = -\frac{2}{3}$ ✓ (4)

vereenvoudig ✓

$6\sin\theta = -4\cos\theta$ ✓

$\tan\theta$ ✓

[32]

6.1 $\sin(x+30^\circ) = \cos 3x$

$\sin(x+30^\circ) = \sin(90-3x)$ ✓

$x+30^\circ = 90^\circ - 3x + 360^\circ n$ ✓

$4x = 60^\circ + 360^\circ n$

$x = 15^\circ + 90^\circ n$

$x+30^\circ = 180 - (90-3x) + 360^\circ n$ ✓

$x+30^\circ = 180^\circ - 90^\circ + 3x + 360^\circ n$

$-2x = 60^\circ + 360^\circ n$

$x = -30^\circ - 180^\circ n$ ✓

$n \in Z$ ✓

(6)

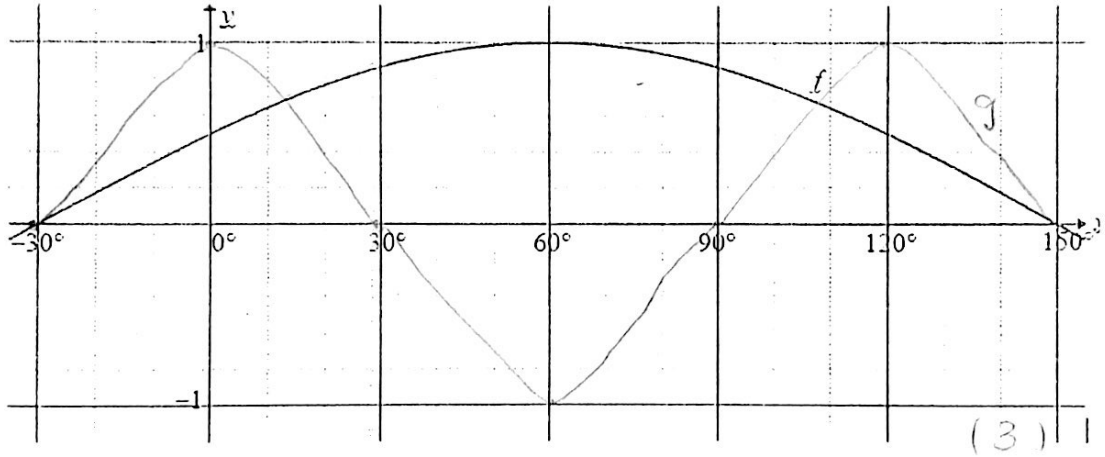
sin - sin ✓

✓✓ alle moontlik

✓✓ alle antw

$n \in Z$ ✓

6.2.1



(3)

maks ✓

min ✓

x-afsnitte ✓

6.2.2 120° ✓

(1)

-120° ✓

6.2.3 $15^\circ \leq x \leq 105^\circ$ ✓ ✓ , -30°, 150°

(3)

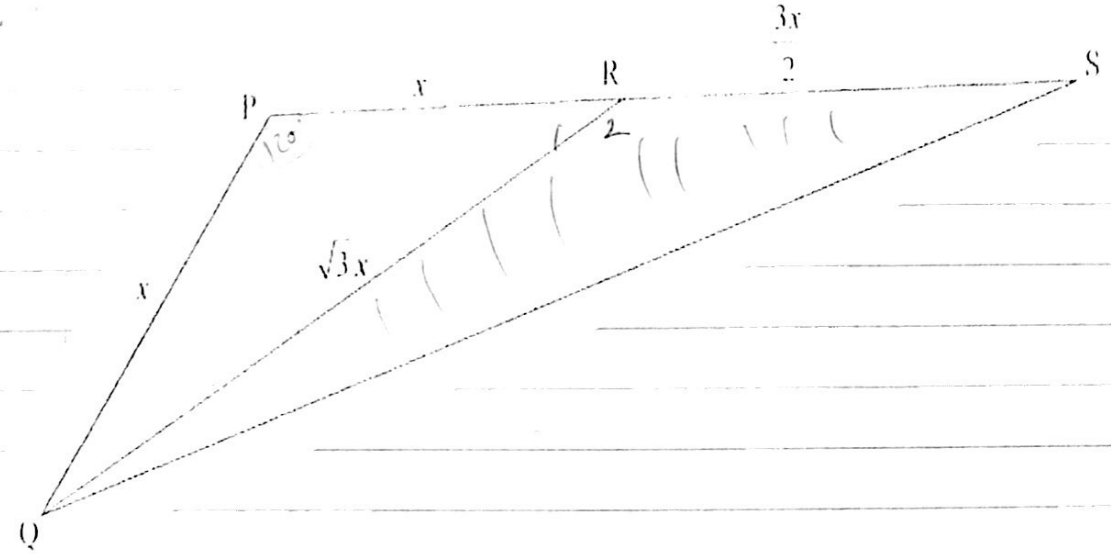
grense ✓

Notasie

(-1) Notasie verkeerd

$-30, 150$ ✓

[13]



7.1 $(\sqrt{3}x)^2 = x^2 + x^2 - 2(x)(x)\cos P$ ✓ — subst in form ✓

$3x^2 = 2x^2 - 2x^2 \cos P$ ✓ — manipulation

$2x^2 \cos P = -x^2$

$\cos P = \frac{-x^2}{2x^2}$

$\cos P = -\frac{1}{2}$ ✓ — cos P ✓

$P = 180° - 60° = 120°$ ✓ (4) — ∠P ✓

7.2 $\angle PRQ = 30°$ (gelykbenige Δ, som v. Δ^e) ✓ — ∠R ✓ + r

$\angle QRS = 150°$ (vgyuit lyn) ✓ — ∠R₂ ✓ + r

Opp $\Delta QRS = \frac{1}{2}\left(\frac{3x}{2}\right)(\sqrt{3}x)\sin 150°$ ✓ — subst ✓

$= \frac{3\sqrt{3}}{8}x^2$ $(0{,}65x^2)$ ✓ — antw ✓

[8]

$\Delta PQR = \frac{1}{2} \cdot x \cdot x \cdot \sin 120$

$= \frac{\sqrt{3}}{4}x^2$ $(0{,}43x^2)$ (2/4)

of.

$\frac{1}{2} \times \left(2\frac{1}{2}x\right)\sin 120°$

$\frac{5\sqrt{3}}{8}x^2$ $(1{,}08x^2)$. (2/4)

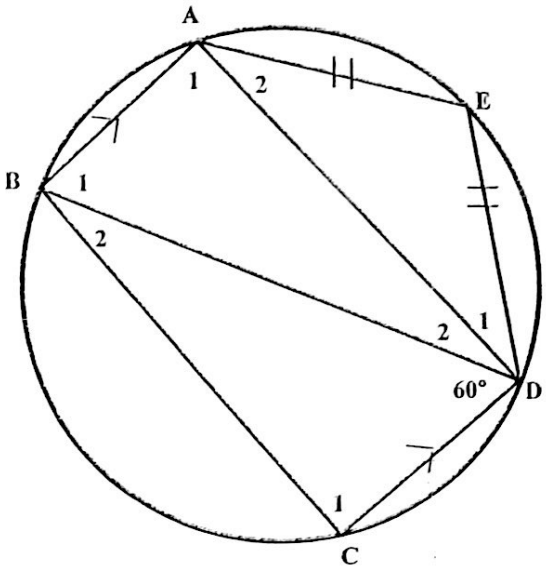
Vraag 8

8.1 loodlyn ✓ (1) S ✓

8.2 gelyke aan hoek in oorstaande segment wat deur koord onderspan word. ✓ (1) S ✓

8.3 saam 180° ✓ (1) S ✓

8.2



8.2.1 $\angle C_1 = 90°$ ✓ ($\angle$ in semi-$\odot$) (2) antw R ✓

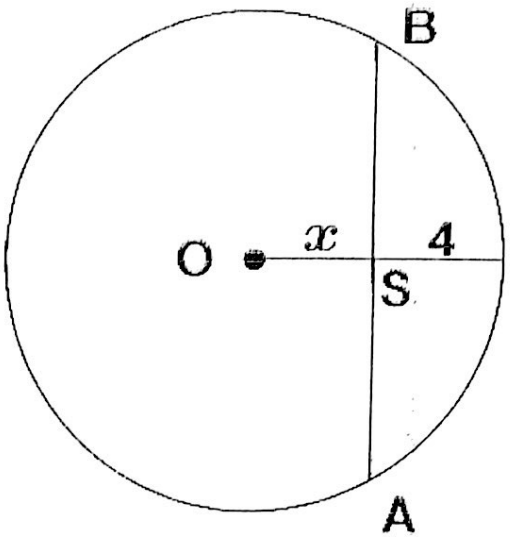
8.2.2 $\angle B_1 = 60°$ ✓ (Verw $\angle$e $AB \parallel DE$) (2) antw R ✓

MF 8.2.3 $\angle E = 120°$ ✓ (tos ✓ $\angle$e kvn) (2) antw R ✓

8.2.4 $\angle D_1 = 30°$ (Som v. $\angle$e Δ, gelykbenige Δ) (2) antw R ✓

MF

8.3 $\angle OSB = 90^\circ$ ✓ (radius halveer koord) ✓



S ✓
R ✓

In $\triangle SOB$:

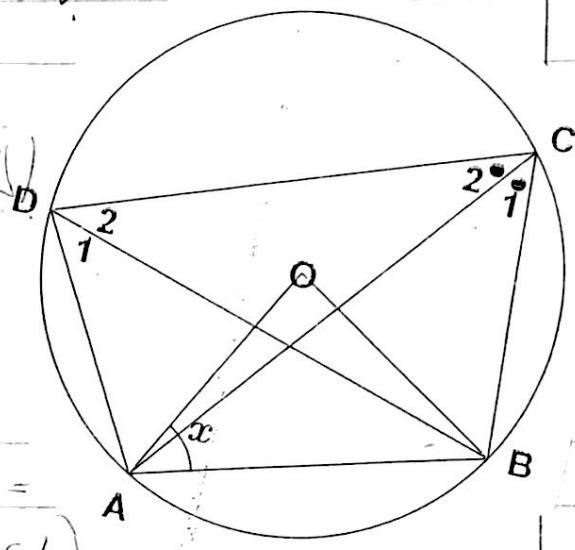
$(x+4)^2 = x^2 + 10^2$ (Pyth) ✓ S+R

$x^2 + 8x + 16 = x^2 + 100$ ✓ vereenv.

$8x = 84$

$x = \frac{21}{2}$ (10,5) (5) ✓ antw.

8.4



$\angle OBA = x$ (gelykbenige $\triangle$) ✓ S+R ✓

$\angle AOB = 180 - 2x$ ✓ (som v. $\angle$e $\triangle = 180^\circ$) S+R ✓

$\angle C_1 = 90 - x$ (middpt $\angle$ = 2× omtreks $\angle$) ✓ S+R ✓

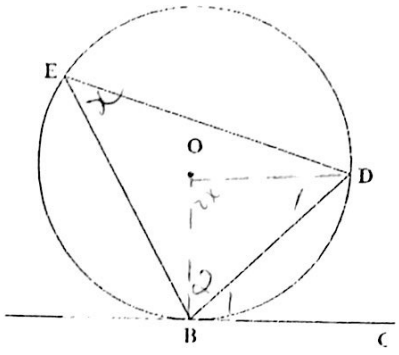
$\angle C_2 = 90^\circ - x$ (gegee) S ✓

$\angle C_{1+2} = 180 - 2x$ ✓

$\angle DAB = 2x$ (tot $\angle$e koord) ✓ R ✓

(5)

[21]



9.1 Konstr OA en OB ✓ Konstr ✓

Maak $\angle E = x$

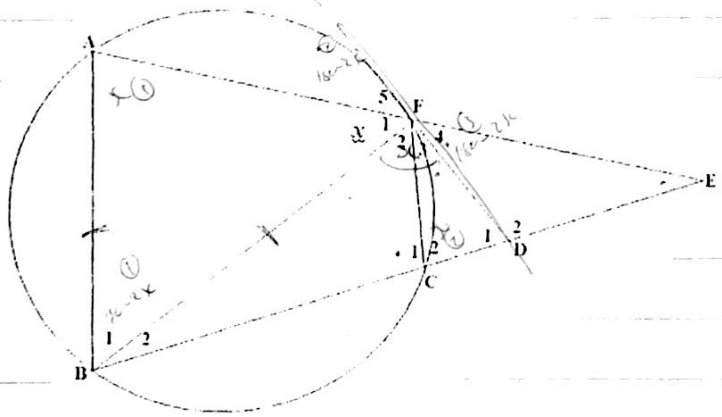
$\angle O = 2x$ ✓ (middpts $\angle$ = 2x omtreks $\angle$) ✓ $\angle O$ ✓ R ✓

$\angle B_2 = \angle D_1$ ($\angle$'e om gelykbenige $\triangle BOD$, radiusse) ✓ $\angle B_2$ + R

$= 90 - x$ ✓

$\angle B_1 = x = \angle C$ (radius ⊥ raaklyn) ✓ R ✓

(5)



9.2.1 $\angle A = x$ ✓ (gelykbenige $\triangle$) ✓ h ✓ R –

$\angle C_2 = x$ ✓ (buite $\angle$ kvh) ✓ (4) h ✓ R ✓

$\angle E_{2+3} = x$ ($\angle$ raaklyn, koord)

9.2.2 $\angle B_1 = 180 - 2x$ ✓ (som v. $\angle$e $\triangle = 180°$) h ✓ R ✓

$\angle F_3 = 180 - 2x$ ✓ ($\angle$ tussen raaklyn en koord) h ✓ R ✓

$\angle F_4 = 180 - 2x$ ✓ (regoorst $\angle$e) (5) h ✓ R ✓

9.2.3 $\angle F_2 = x - \angle F_3$ ✓ (gestrekte $\angle$) ✓ $\angle F_2$ ✓ R –

~~$\angle F_2 = 180° - 3x - \angle F_3$~~

In $\triangle FEB$ is

$\angle E = x - \angle F_3$ ✓ (som v. $\angle$e $\triangle = 180°$) ✓ $\angle E$ ✓ R ✓

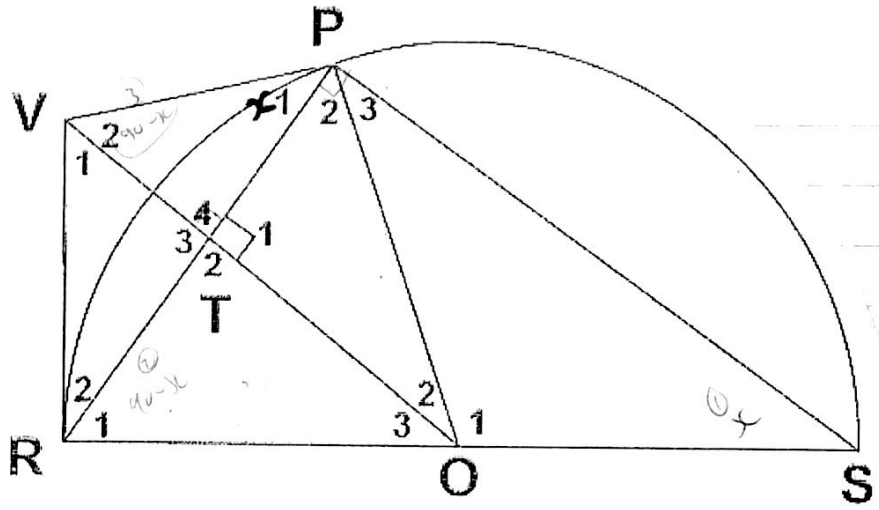
~~$\angle E = 180° - 3x - \angle F_3$~~

$\therefore \angle F_2 = \angle E$

$\therefore$ raaklyn ($\angle$ tussen raaklyn en koord) ✓ reas ✓

(5)

9.3



9.3.1 $\angle P_{2+3} = 90°$ ✓ ($\angle$ in semi ⊙) ✓
$VO \parallel PS$ (ko-binne $\angle$e $= 180°$) ✓
(3)

$\angle P_{2+3}$ ✓ R ✓
R ✓

9.3.2 $\angle P_1 = x$
$\therefore \angle S = x$ ✓ ($\angle$ tussen raaklyn en koord)
$\angle R_1 = 90 - x$ (som v. $\angle$e $\Delta = 180°$)
In ΔPVT is $\angle V_2 = 90 - x$ (som v. $\angle$e Δ)
$\therefore PORV$ is kvh (PO onderspan gelyke $\angle$e) ✓
(5)

[27]