

Memorandum.

Gr 12 September 2016 V2

1.1 $A = 214,8643216$ ✓

$B = -1,110552764$ ✓

$y = 214,86 - 1,11x$ ✓ *v. l. p. nte
me A en B
sekyt.
0 as verkerdlaformel.* (3)

A ✓

B ✓

vgl ✓

1.2 $r = -0,88$ ✓✓

⊖) vir Rending.

1.3 $y = 214,86 - 1,11(40)$ ✓
 $= 170$ ✓

subst ✓

170 ✓

1.4 $202 - 0,55x = 214,86 - 1,11x$ ✓
 $0,56x = 12,86$

✓
stok vgl's =

$x = 22,967$ ✓
 $\therefore 23$ ✓

✓
antw
aanvraag
23.06.22,96

[9]

2.1	Afstand	K Freqw.	Frekwensie	
	$0 < x < 10$	130	130	1 per k. dom
	$10 < x < 20$	315	185	
	$20 < x < 30$	405	90	
	$30 < x < 40$	480	75	
	$40 < x < 50$	500	20	
	✓	✓	✓	(3)

2.2 $27 - 9 = 18$ (aanvraag ± 2 opdrag) (3)

✓
Q₁ Q₃ 1k ✓

[6]

$$31 \quad \frac{1568}{24} = 65,33 \quad \checkmark$$

(1) antw ✓

$$32 \quad \frac{68}{100} \cdot 24 = 16,32 \quad \checkmark$$

$$\frac{68}{100} \cdot 24 \quad \checkmark$$

Altweer
x 0/2

kinder → MF

16 leerders ✓

8 leerders 1 punt

(2) 16 ✓

$$33 \quad \left. \begin{array}{l} 55,8 + 14,5 \\ 55,8 - 14,5 \end{array} \right\} \begin{array}{l} 41,3 \\ 70,3 \end{array} \quad \checkmark \rightarrow \checkmark$$

(2) 41,3 ✓
70,3 ✓

$$3.4 \quad \begin{array}{l} \text{Wsk: } 65,33 + 16 = 81,73 \\ \quad \quad 65,33 + 26 = 98,73 \\ \text{Rel: } 55,8 + 16 = 70,3 \\ \quad \quad 55,8 + 26 = 84,8 \end{array} \left. \begin{array}{l} \text{A tussen} \\ 16 \text{ en } 26 \\ \text{L } > 26 \end{array} \right\} \checkmark$$

A: 16 → 26 ✓

L > 26 ✓

∴ Lynnze beter ✓

(3) gewoortling ✓

[8]

4.1 $M_{AC} = \frac{4+2}{3+1} = \frac{3}{2} \checkmark$

m ✓

$y = \frac{3}{2}x + c$
 of
 (-1; -2) $-2 = \frac{3}{2}(-1) + c$ $(4 = \frac{3}{2}(3) + c$
 $-\frac{1}{2} = c \checkmark$ $c = -\frac{1}{2}$ (2) ✓

c ✓

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

4.2 $M_{BD} = -\frac{2}{3} \checkmark$

m ✓

$M_{PT AC} = (1; 1) \checkmark$ $x\text{-afsnit } (0; \frac{1}{3})$
 $y = -\frac{2}{3}x + c$

midelpunt
a ✓ y ✓

(1; 1) $1 = -\frac{2}{3}(1) + c$

$\frac{1}{3} = c \checkmark$ (4) ✓

c ✓

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

4.3 $AD = CD \checkmark$

$y = -\frac{2}{3}(6) + \frac{5}{3}$
 $= -\frac{7}{3}$

afstand ✓

$\sqrt{(6+x)^2 + (y+2)^2} = \sqrt{(6-3)^2 + (y-4)^2} \checkmark$

subst ✓

$49 + y^2 + 4y + 4 = 9 + y^2 - 8y + 16 \checkmark$

vereenwoordig

$12y = +28$ $m = \frac{-y}{1-6} = \frac{-2}{3} \checkmark$

$y = -\frac{7}{3}$

$3 - 3y = 10$ (4) ✓

y ✓

$-3y = 7$ [10]
 $y = -\frac{7}{3}$

5.11 $y = x + k$

$\tan \alpha = 1 \checkmark$

$\tan \alpha = 1$

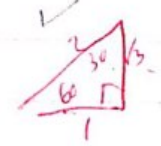
$\alpha = 45^\circ \checkmark$ (2) ✓

45°

5.12 $\beta = 60^\circ$ mf (buitel \angle) ✓

β ✓

$m = \tan 60^\circ = \sqrt{3} \checkmark$



$\frac{\sqrt{3}}{3} \checkmark$

$y = \sqrt{3}x - 1 \checkmark$ (3) ✓

$\sqrt{3}$ ✓

$$521) \quad x^2 + y^2 - 8x + 6y + t = 0$$

$$x^2 - 8x + 16 + y^2 + 6y + 9 = -t + 16 + 9$$

$$(x-4)^2 + (y+3)^2 = -t + 25$$

✓
+16 weerstanc
+9 weerstanc
-faktoriseren

$$M(4, -3) \quad \checkmark \quad \text{Stegs antwoord 5 punte.} \quad (5)$$

✓
Middelpunt

$$522) \quad r = \sqrt{-t + 25} \quad \checkmark \quad (1)$$

radius

$$523) \quad \left. \begin{aligned} MB^2 &= Am^2 - AB^2 \\ &= (\sqrt{73})^2 - 25 \\ &= 48 \end{aligned} \right\} \text{(Pyth)} \quad \checkmark$$

✓
toepassing Pyth

$$MB^2 = 48 \quad \checkmark$$

$$MB = \sqrt{48} = 4\sqrt{3}$$

$$-t + 25 = 48$$

$$t = -23 \quad \checkmark$$

$$(3)$$

$$t = -43$$

$$524) \quad 3y + 4x + 16 = 0$$

$$3y = -4x - 16$$

$$y = -\frac{4}{3}x - \frac{16}{3} \quad \checkmark$$

✓
standaardvorm

$$M_{MB} = \frac{3}{4} \quad \checkmark$$

$$M_{me} \quad \checkmark$$

$$y = \frac{3}{4}x + c$$

$$-3 = \frac{3}{4}(4) + c$$

$$-3 = 3 + c$$

$$-6 = c \quad \checkmark$$

$$c = -6$$

$$y = \frac{3}{4}x - 6$$

$$\left. \begin{aligned} 4y - 3x + 24 &= 0 \\ \text{of } 3x - 4y - 24 &= 0 \end{aligned} \right\} \checkmark \quad (4)$$

$$\left. \begin{aligned} 4y - 3x + 24 &= 0 \\ \text{of} \\ 3x - 4y - 24 &= 0 \end{aligned} \right\}$$

53

$$x + y + 6 = 0$$

$$y = -x - 6 \quad \checkmark$$

$$x^2 + y^2 + 4x - 4 = 0$$

$$x^2 + (-x - 6)^2 + 4x - 4 = 0 \quad \checkmark$$

$$x^2 + x^2 + 12x + 36 + 4x - 4 = 0$$

$$2x^2 + 16x + 32 = 0 \quad \checkmark$$

$$x^2 + 8x + 16 = 0 \quad \checkmark$$

$$(x + 4)^2 = 0 \quad \checkmark$$

$$x = -4 \quad \checkmark$$

$$y = -(-4) - 6 = -2 \quad \checkmark$$

slegs een raakpunt, dus raaklijn \checkmark

$$(-4; -2)$$

(7)

[25]

$$y = -x - 6 \quad \checkmark$$

Subst \checkmark standaardvorm \checkmark factore \checkmark x \checkmark y \checkmark
geradsteking \checkmark

$$6.1 \quad \frac{2 \cos(70^\circ + x) \sin 206^\circ \cos 386^\circ}{\sin 52^\circ}$$

$$= \frac{-2 \sin x \cdot \sin 26^\circ \cos 26^\circ}{2 \sin 26^\circ \cos 26^\circ}$$

$$= -\sin x \quad (5)$$

$$-2 \sin x \checkmark$$

$$- \sin 26^\circ \checkmark$$

$$\cos 26^\circ \checkmark$$

$$2 \sin 26^\circ \cos 26^\circ \checkmark$$

$$\sin x \checkmark$$

$$6.2 \quad \frac{\sin 7x \cos 3x - \cos 7x \sin 3x}{\tan 2x} - 1$$

$$= \frac{\sin(7x - 3x)}{\tan 2x} - 1$$

$$= \frac{\sin 4x}{\tan 2x} - 1$$

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

$$= 2 \cos^2 2x - 1 \checkmark$$

$$= \cos 4x \checkmark$$

$$\sin 4x \checkmark$$

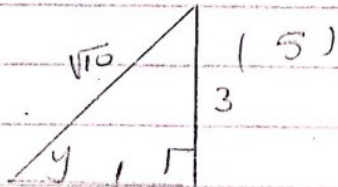
$$2 \sin 2x \cos 2x \checkmark$$

$$\frac{\sin 2x}{\cos 2x} \checkmark$$

$$\cdot \cos 2x \checkmark$$

$$2 \cos^2 2x - 1 \checkmark$$

$$\cos 4x \checkmark$$



$$6.3.1 \quad \sqrt{10} \sin(x+y)$$

$$= \sqrt{10} [\sin x \cos y + \cos x \sin y] \checkmark$$

$$= \sqrt{10} \sin x \cos y + \sqrt{10} \cos x \sin y$$

$$= \sqrt{10} \sin x \frac{1}{\sqrt{10}} + \sqrt{10} \cos x \frac{3}{\sqrt{10}} \checkmark$$

$$= \sin x + 3 \cos x \quad (3)$$

uH breeding

subst

antw

$$6.3.2 \quad \cos y = \frac{1}{\sqrt{10}}$$

$$y = 71,6^\circ \checkmark$$

$$71,6^\circ \checkmark$$

$$633 \quad \sin \alpha + 3 \cos \alpha = \sqrt{10} \sin(\alpha + \gamma)$$

$$2 \sin \alpha + 6 \cos \alpha = 2\sqrt{10} \sin(\alpha + \gamma) \quad \checkmark$$

$\times 2 \quad \checkmark$

$$2\sqrt{10} \sin(\alpha + \gamma) = -3 \quad \checkmark$$

$$2\sqrt{10} \sin(\alpha + \gamma) = -3$$

$$\sin(\alpha + 71,6^\circ) = \frac{-3}{2\sqrt{10}}$$

$$= -0,474 \quad \checkmark$$

$$-0,474 \quad \checkmark$$

$$\text{von } \angle = 28,316 \dots \checkmark$$

$$\text{von } \angle \quad \checkmark$$

3de

4de

$$\alpha + 71,6^\circ = 180^\circ + 28,3 + 360^\circ n$$

$$\alpha + 71,6^\circ = 360^\circ - 28,3 + 360^\circ n$$

$$\alpha = 136,72 + 360^\circ n \quad \checkmark$$

$$\alpha = 260,08 + 360^\circ n$$

alle α -Werte \checkmark

$n \in \mathbb{Z} \quad (6)$

$$641 \quad \frac{AE}{\sin 15,6^\circ} = \frac{20}{\sin 90^\circ} \quad \checkmark$$

Subst \checkmark
sin-formule
(op. det.)

$$AE = \frac{20 \cdot \sin 15,6}{\sin 90^\circ}$$

$$= 5,38 \text{ m} \quad \checkmark$$

(2)

AE \checkmark

$$642 \quad BD^2 = 40^2 + 41^2 \quad (\text{Pyth})$$

$$= 1681$$

$$BD = 41 \quad \checkmark$$

BD \checkmark

$$AD^2 = 20^2 + 41^2 - 2(20)(41) \cos 15,6^\circ \quad \checkmark$$

$$= 501,41 \quad \checkmark$$

cos-formule
subst.

$$AD = 22,39 \text{ m} \quad \checkmark$$

(4)

AD \checkmark

AD \checkmark

7.1 120° ✓ (1) 120° ✓
 7.2 1 ✓ ✓ (1) 1 ✓
 7.03 $-2 \leq y < 0, y \in \mathbb{R}$ (2) grenzen

7.3 $\cos(x - 60^\circ) = \sin 3x$
 4 $\cos(x - 60^\circ) = \cos(90^\circ - 3x)$ ✓ $\cos = \cos$

$x - 60^\circ = 90^\circ - 3x + 360^\circ n$	$x - 60^\circ = 360^\circ - (90^\circ - 3x) + 360^\circ n$	2 kwadratische algebraische oplossingen ✓ ✓
$4x = 150^\circ + 360^\circ n$	$x - 60^\circ = 270^\circ + 3x + 360^\circ n$	
$x = 37,5^\circ + 90^\circ n$ ✓	$-2x = 330^\circ + 360^\circ n$ $x = -165^\circ - 180^\circ n, n \in \mathbb{Z}$	

$x = 37,5^\circ; 15^\circ; -52,5^\circ$ ✓ (-1 fact) (6) x -waarden

OF $\cos(x - 60^\circ) = \sin 3x$
 $\sin[90^\circ - (x - 60^\circ)] = \sin 3x$ ✓ $\sin = \sin$
 $\sin(150^\circ - x) = \sin 3x$

$150^\circ - x = 3x + 360^\circ n$	$180^\circ - 3x = 150^\circ - x + 360^\circ n$	2 kwadratische algebraische oplossingen ✓ ✓
$-4x = -150^\circ + 360^\circ n$	$-2x = -30^\circ + 360^\circ n$	
$x = 37,5^\circ - 90^\circ n$ ✓	$x = 15^\circ - 180^\circ n, n \in \mathbb{Z}$	

$x = 37,5^\circ; 15^\circ; -52,5^\circ$ ✓ (-1, fact)

7.5 $-120^\circ < x < 60^\circ$ ✓ (2) $-120^\circ; 60^\circ$
 not...

7.6 $20^\circ < x < 40,5^\circ$ ✓ (2) $20^\circ; 40,5^\circ$
 not...

17 $\cos(x) = \cos(60^\circ)$ ✓
 $\cos(x - 15^\circ)$ ✓ (2) $\cos(x - 15^\circ)$
 [16]

6

NEZ ✓ (6 punte)

dan vaar de $\sqrt{9x^2 - 400}$ (verkry dit deur deel van 8.12 te doen)

8.11 OE = 2x ✓ (OD radius, OE:EO = 2:1) (1) 2x ✓

8.12 EB = 20 cm ✓ (radius L word halveer word) ✓ S/R ✓

$(3x)^2 = (2x)^2 + 20^2$ ✓ (Pyth) Pyth koop + rede.

$9x^2 = 4x^2 + 400$

$5x^2 = 400$

$x^2 = 80$

$x = 4\sqrt{5}$ ✓

(4)

Pyth koop + rede.

8.2 $\angle Q_3 = 25^\circ$ ✓ (gelyke Le teenoor gelyke sye) $\angle Q_3$ ✓ / R ✓
 $\angle S_2 = 50^\circ$ ✓ (buite \angle v Δ) (2) $\angle S_2$ ✓ / R ✓

8.22 $\angle Q_{1+2} = 90^\circ$ ✓ (L in semi-sirkel) $\angle Q_{1+2}$ ✓ / rede ✓
 $\angle P = 40^\circ$ ✓ (som van Le van Δ) (2) $\angle P$ ✓ / rede ✓

8.23 $\angle M_2 = 80^\circ$ ✓ (middelpunt $\angle = 2 \times$ omtrek \angle) (2) S/R ✓

8.24 $\angle R_1 = 140^\circ$ ✓ (Le van kurb) (2) S/R ✓

8.31 $\angle R = x$ ✓ (L tussen raaklyn en kurb) $\angle R = x$ ✓
 $= \angle Q_1$ (gegeef) $\hat{r}_1 = x$ (raaklyn, kurb) R ✓
 $\hat{r}_2 = x$ (raaklyn, kurb) rede ✓

TQ || SP (Oorekomsige Le gelyk) (3)

8.32 TP = TS (Raaklyne vanaf punt) ✓ S/R ✓

$\angle S_1 = x$ (gelyke Le teenoor gelyke sye) ✓ S/R ✓

$\angle S_1 = \angle Q_1$ (reeds bewys) ✓ $\angle S_1 = \angle Q_1$ ✓

O P T S is kurb (TP onderop gelyke Le) (4) rede ✓

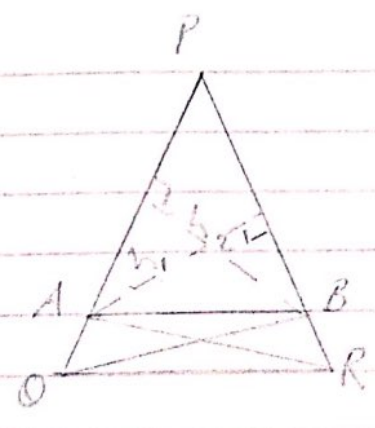
8.33 $\angle P_1 = \angle Q_2$ ✓ (kurb TS onderop gelyke Le) ✓ S/R ✓
 $= \angle Q_1 = x$ ✓ \therefore TQ halveer $\angle S$ op (3) $\angle P_1 = \angle Q_1$ ✓

(3)

91

$$\frac{\text{Opp } \Delta PAB}{\text{Opp } \Delta ABC} = \frac{\frac{1}{2} h_2 \cdot PA}{\frac{1}{2} h_1 \cdot CA}$$

$$= \frac{PA}{CA}$$



(selfe hooftopunt, selfe hoogte h_2) ✓

✓
S/R ✓

$$\frac{\text{Opp } \Delta PAB}{\text{Opp } \Delta BR} = \frac{\frac{1}{2} h_1 \cdot PB}{\frac{1}{2} h_1 \cdot BR}$$

$$= \frac{PB}{BR}$$

(selfe hooftopunt selfe hoogte h_1) ✓

✓
S/R ✓

Opp $\Delta ABO =$ Opp ΔABR (d/s basis AB, d/s hoogte. want $AB \parallel OR$) ✓

Δ en rechte ✓

$$\therefore \frac{\text{Opp } \Delta PAB}{\text{Opp } \Delta ABO} = \frac{\text{Opp } \Delta PAB}{\text{Opp } \Delta ABR} \quad (\Delta AOB \text{ gemen, } \Delta ABO = \Delta ABR)$$

$$\therefore \frac{PA}{OA} = \frac{PB}{PR} \quad (6)$$

S ✓

921 In ΔAEC is

$$\frac{BC}{AB} = \frac{5}{3} \quad \checkmark \text{ (lyn } BD \parallel \text{ sy } AE) \checkmark$$

✓
S/R ✓

In ΔAEC is $\frac{FE}{EC} = \frac{3}{5} \quad \checkmark \text{ (lyn } BE \parallel \text{ sy } AF) \checkmark$
(4)

✓
S/R ✓

$$\frac{AB}{BC} - \frac{FE}{EC} = \frac{ED}{DC} = \frac{3}{5} \quad \checkmark$$

Merke
Methode

$\therefore FE = \frac{3 \cdot EC}{5}$ en $DC = \frac{5 \cdot ED}{3}$ ✓

$FE \parallel EC$
 $DC \parallel ED$ ✓

$$\frac{FE}{DC} = \frac{\frac{3 \cdot EC}{5}}{\frac{5 \cdot ED}{3}} = \frac{9 \cdot EC}{25 \cdot ED}$$

$$= \frac{9}{25} \cdot \frac{8}{3} =$$

$$= \frac{24}{25} \quad \checkmark$$

(4)

antw \checkmark

723

$$\begin{array}{l} \text{opp } \triangle BDC = \frac{1}{2} \cdot 5y \cdot 5x \cdot \sin C \quad \checkmark \\ \text{opp } \triangle AEC = \frac{1}{2} \cdot 8y \cdot 8x \cdot \sin C \quad \checkmark \end{array}$$

opp form \checkmark
opp form \checkmark

$$= \frac{25}{64}$$

\checkmark

(3)

antw \checkmark

Lynze: Nie net met
gemiddeld.

9.4.1 In $\triangle ASW$ en $\triangle AES$ is:

(1) $\angle A_2 = \angle A_2$ (gemeen) ✓

(2) $\angle S_1 = \angle E_1$ (\angle tussen raaklijn en koord) ✓

(3) $\angle W_2 = \angle S_{1+2}$ (som v. \angle Δ) ✓

$\therefore \triangle ASW \parallel \triangle AES$ (LLL) ✓ (3)

S ✓

S/R ✓

S/R ✓

9.4.2 $\frac{AS}{AE} = \frac{AW}{AS}$ (Δ^o III)

$AS^2 = AE \cdot AW$

} ✓
(1)

✓
gevolgrelking
en 9.4.1

9.4.3 In $\triangle ACW$ en $\triangle AEC$ is:

(1) $\angle A_1 = \angle A_1$ (gemeen) ✓

(2) $\angle C_1 = \angle Y_1$ (voor \angle $AC \parallel YZ$) ✓

$= \angle E_2$ (rechte \angle kruis) ✓

(3) $\angle W_1 = \angle C_{1+2}$ (som v. \angle Δ) ✓

$\therefore \triangle ACW \parallel \triangle AEC$ (LLL) ✓

S/R ✓

S/R ✓

S/R ✓

S/R ✓

$\frac{AC}{AE} = \frac{AW}{AC}$ (Δ^o III) ✓

$AC^2 = AW \cdot AE$

$AC = AS$ (uit 9.4.2)

} ✓
(6)

✓
gevolgrelking

[27]