

MEMORANDUM

VRAESTEL 1

WISKUNDE GRAAD 10

TOTAAL: 100 PUNTE

INSTRUKSIES

- Die memorandum dien om moontlike oplossings vir die probleme in die vraestel aan die leerders duidelik te maak. Leerders moet bewus wees dat die meeste probleme talle moontlike oplossingsmetodes het en nie net dié in die memorandum nie.

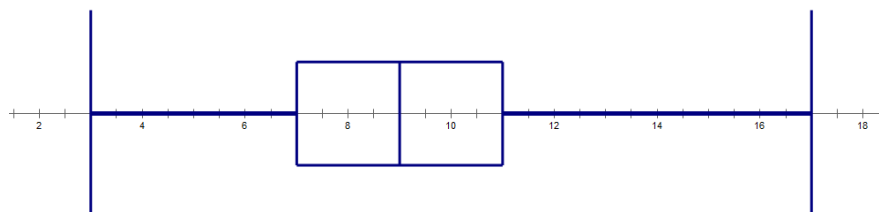
VRAAG 1

1.1 a) 11

b)
$$\frac{2(3)+1(4)+2(5)+1(6)+3(7)+4(8)+4(9)+3(10)+5(11)+3(12)+1(13)+1(17)}{30} = 8,87 \text{ cm}$$

c) Ja, 17 kan as 'n uitskieter gesien word, want die verskil tussen 17 en 13 is aansienlik hoër as die verskil tussen enige ander twee mates van boontjieplante.

d)



Die data is so te sê simmetries. Jy kan ook aanvaar dat die data effens skeef is na regs.

1.2 a) $45 \leq x < 60$

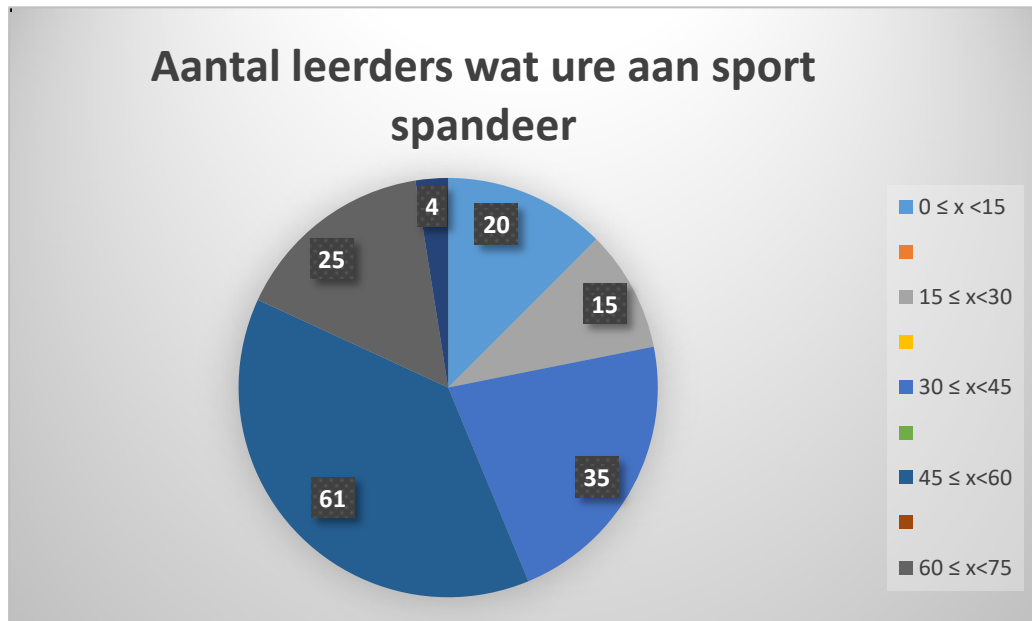
b) Middelpunte van elke klas:

P	Middelpunt	Frekwensie
$0 \leq x < 15$	7,5	20
$15 \leq x < 30$	22,5	15
$30 \leq x < 45$	37,5	35

$45 \leq x < 60$	52,5	61
$60 \leq x < 75$	67,5	25
$75 \leq x < 90$	82,5	4

Gemiddeld: $\frac{15,5(20)+22,5(15)+37,5(35)+52,5(61)+67,5(25)+82,5(4)}{160} = 44,88 \text{ ure}$

c)



VRAAG 2

2.1 a) In 'n parallelogram is teenoorstaande sye gelyk en ook parallel.

$$dAB = \sqrt{(-5 - 2)^2 + (5 - 8)^2} = \sqrt{58} \text{ eenhede}$$

$$dDC = \sqrt{(-5 - 2)^2 + (-1 - 2)^2} = \sqrt{58} \text{ eenhede}$$

Vanaf die diagram:

$$dBC = 6 \text{ eenhede}$$

$$dAD = 6 \text{ eenhede}$$

$$mAB = \frac{5 - 8}{-5 - 2} = \frac{3}{7}$$

$$mDC = \frac{-1 - 2}{-5 - 2} = \frac{3}{7}$$

Vanaf die diagram

BC is parallel aan AD , want beide is parallel aan die y -as.

Dus is $AB = DC$ en $BC = AD$; en AB is parallel aan DC en BC is parallel aan AD . Dus is $ABCD$ 'n parallelogram.

b) Dit is die punt waar die lyn AC , die lyn BD sny.

$$y = mx + c$$

$$m_{AC} = \frac{5-2}{-5-2} = -\frac{3}{7}$$

$$m_{BD} = \frac{-1-8}{-5-2} = \frac{9}{7}$$

$$2 = -\frac{2}{7}(2) + c$$

$$8 = \frac{9}{7}(2) + c$$

$$2 + \frac{2}{7}(2) = c$$

$$2 - \frac{9}{7}(2) = c$$

$$c = \frac{18}{7}$$

$$c = -\frac{4}{7}$$

$$y = \frac{2}{7}x + \frac{18}{7}$$

$$y = \frac{9}{7}x - \frac{4}{7}$$

$$\frac{2}{7}x + \frac{18}{7} = \frac{9}{7}x - \frac{4}{7}$$

$$2x + 18 = 9x - 4$$

$$22 = 7x$$

$$x = \frac{22}{7}$$

$$y = \frac{2}{7}\left(\frac{22}{7}\right) + \frac{18}{7} = \frac{170}{49}$$

Die diagonal sal sny by die punt $\left(\frac{22}{7}; \frac{170}{49}\right)$

2.2 a) As QS loodreg op PT is dan is $m_{QS} \times m_{PT} = -1$

$$m_{QS} = \frac{6-4}{-2+3} = 2$$

$$\therefore m_{PT} = -\frac{1}{2}$$

$$\therefore \frac{5-y}{-5-x} = -\frac{1}{2}$$

$$y = 6 \text{ en } x = -7 \text{ OF } y = 4 \text{ en } x = -3$$

$T(-7; 6)$ OF $T(4; -3)$, maar T is in die tweede kwadrant, daarom is $T(4; -3)$

$$\text{b) } M_{PT} = \left(\frac{-5+4}{2}; \frac{5-3}{2} \right)$$

$$M_{PT} = \left(\frac{1}{2}; 1 \right)$$

$$\text{c) } m_{QS} = \frac{4-6}{-3+2} = -\frac{2}{1}$$

$$W(-1; 3) \text{ OF } W(-5; 5) \text{ OF } W(0; 5) \text{ OF } W(-4; 7)$$

VRAAG 3

3.1 a) $\tan \theta = 0,776$

$$\theta = 37,81^\circ$$

$$\text{b) } 2 \sin \frac{1}{2}x + 1 = 1,8$$

$$2 \sin \frac{1}{2}x = 0,8$$

$$\sin \frac{1}{2}x = 0,4$$

$$\frac{1}{2}x = 23,57817848$$

$$x = 47,16^\circ$$

$$c) \tan^2 \alpha = 36$$

$$\tan \alpha = 6$$

$$\alpha = 80,54^\circ$$

$$d) \sin 114^\circ + \cos 85^\circ = 1$$

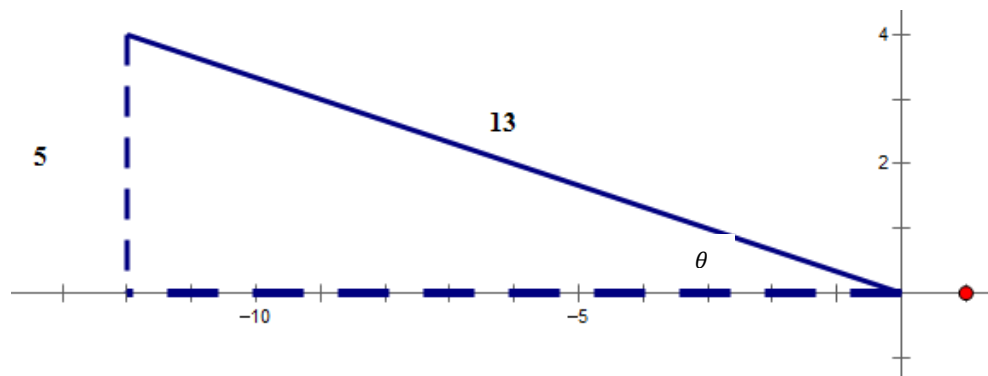
$$e) \sqrt{\tan^2 x \cdot \cos^2 x}$$

$$= \tan x \cdot \cos x$$

$$= \frac{\sin x \cdot \cancel{\cos x}}{\cancel{\cos x} \cdot 1}$$

$$= \sin x$$

3.2 a)



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

$$x^2 = y^2 - r^2$$

$$x = \sqrt{y^2 - r^2}$$

$$x = \sqrt{13^2 - 5^2}$$

$$x = 12$$

Maar x is in die tweede kwadrant so $x = -12$

$$\sin \theta = \frac{5}{13}$$

$$\theta = 22,62^\circ$$

c) i. $\sin \theta \cdot \cot \theta + (-\cos \theta)$

$$= \frac{\sin \theta}{1} \cdot \frac{\cos \theta}{\sin \theta} - \frac{\cos \theta}{1}$$

$$= \cos \theta - \cos \theta$$

$$= 0$$

ii. $\operatorname{cosec} \theta$

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

$$= \frac{13}{5}$$

3.3 $\sin 50^\circ = \frac{114}{AB}$

$\sin 40^\circ = \frac{114}{BC}$

$$AB = \frac{114}{\sin 50^\circ}$$

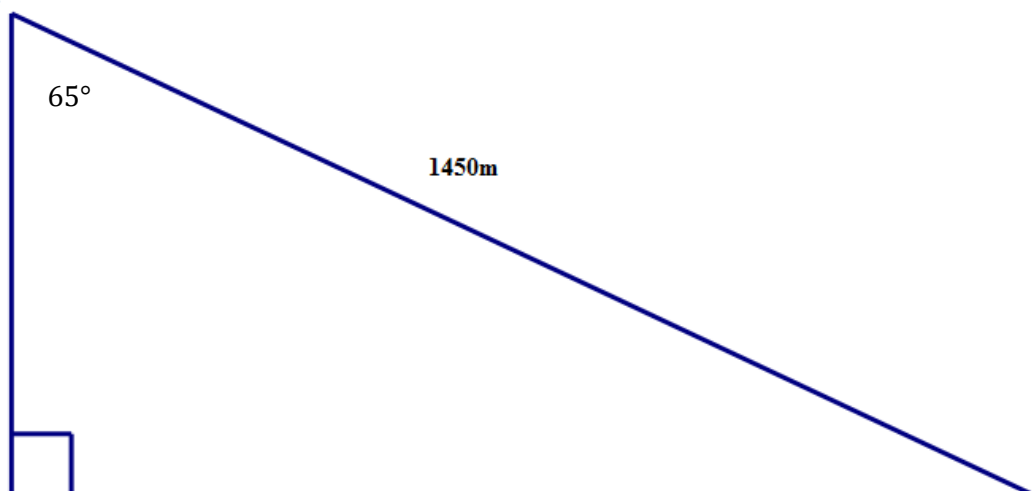
$$BC = \frac{114}{\sin 40^\circ}$$

$$AB = 148,816431 \text{ cm}$$

$$BC = 177,3525163 \text{ cm}$$

$$\alpha = AB + BC = 148,816431 + 177,3525163 = 326,17 \text{ cm} = 3,26 \text{ m}$$

3.4 a) **MAN**



b) $180^\circ - 90^\circ - 65^\circ = 25^\circ$

$$c) \cos 25^\circ = \frac{\text{Horisontale afstand}}{1450 \text{ m}}$$

$$1450 \cdot \cos 25^\circ = 1314,15$$

Die horisontale afstand wat die man gestap het was 1314,15 m

3.5 a) Sin

b) 2

$$c) 0^\circ \leq x \leq 360^\circ$$

d) 360°

$$e) f(x) = \sin 2x + 1$$

$$f) 0 = \sin 2x + 1$$

$$-1 = \sin 2x$$

$$-90 = 2x$$

$$x = -45 \text{ maar } 0^\circ \leq x \leq 360^\circ$$

$$x = -45 + 360 = 315^\circ$$

VRAAG 4

4.1 a) i. $OJ = OH = 4\text{cm}$ (diagonaal van die kort sy van 'n vlieër halveer deur die diagonal van die lang sy)

ii. $I_1 = I_2 = 60^\circ$ (diagonale halveer die hoeke)

iii. In ΔHIO en ΔJIO

$$HI = JI \quad (\text{gegeë})$$

$$OI = OI \quad (\text{gemeenskaplike sy})$$

$$\hat{I}HO = \hat{I}JO \quad (\text{gelyke hoeke teenoor gelyke sye in } \Delta HIJ)$$

$$\therefore \Delta HIO \equiv \Delta JIO \quad (\text{SHS})$$

$$b) y = 180^\circ - 50^\circ - 10^\circ = 120^\circ \quad (\text{som van binnehoeke van } \triangle EDF)$$

$$\hat{G} = 180^\circ - (52^\circ + 50^\circ) - (10^\circ + 15^\circ) = 53^\circ \quad (\text{som van binnehoeke van } \triangle EFG)$$

$$x = 180^\circ - 52^\circ - 53^\circ = 75^\circ \quad (\text{som van binnehoeke van } \triangle EHG)$$

$$c) y - 42^\circ + 28^\circ = 180^\circ \quad (\text{hoeke op 'n reguit lyn})$$

$$y = 180^\circ - 28^\circ + 42^\circ$$

$$y = 194^\circ$$

$$\hat{C} = 28^\circ \quad (\text{teenoorstaande hoeke})$$

$$\hat{A} = 180^\circ - 90^\circ - 28^\circ \quad (\text{som van binnehoeke van 'n driehoek})$$

$$\hat{A} = 62^\circ$$

$$\hat{E} = \hat{A} = 62^\circ \quad (\text{ooreenstemmende hoeke; AB parallel met DC})$$

$$2x - 20^\circ + y - 42^\circ + 280^\circ + 62^\circ + 28^\circ = 360^\circ \quad (\text{revolusie})$$

$$2x = 360^\circ - 28^\circ - 62^\circ - 28^\circ + 42^\circ - 194^\circ + 20^\circ$$

$$2x = 110^\circ$$

$$x = 55^\circ$$

d) In $\triangle ADB$ en $\triangle CBD$

$$D_1 = B_2 \quad (\text{verwisselende hoeke; AD parallel aan BC})$$

$$BD = BD \quad (\text{gemeenskaplike sy})$$

$$D_2 = B_2 \quad (\text{verwisselende hoeke; AB parallel aand DC})$$

$$\therefore \triangle ADB \equiv \triangle CBD \quad (\text{hoek, hoek, sy})$$

$$\therefore AD = BC$$

e) i. $AH^2 = 0,8^2 + \left(\frac{1}{2} \cdot 3\right)^2$

$$AH^2 = 2,89$$

$$AH = \sqrt{2,89}$$

$$AH = 1,7\text{m}$$

ii. $Buiteoppervlak = 3^2 + 2(3)(1,7) - 3^2$

$$Buiteoppervlak = 10,2\text{m}^2$$

Verwysings:

E-Classroom. (2017). Grade10: Mathematics Worksheets.

Laridon, P., J. A., Barnes, H., Cronjé, F., Karam, R., Kitto, A., ... Wilson, H. (2008). *Classroom Mathematics Grade 10 Practice Book NCS*. Sandton: Heinemann Publihsers.