



Besoek www.litnet.co.za vir gratis skole-inhoud.



Gr. 11

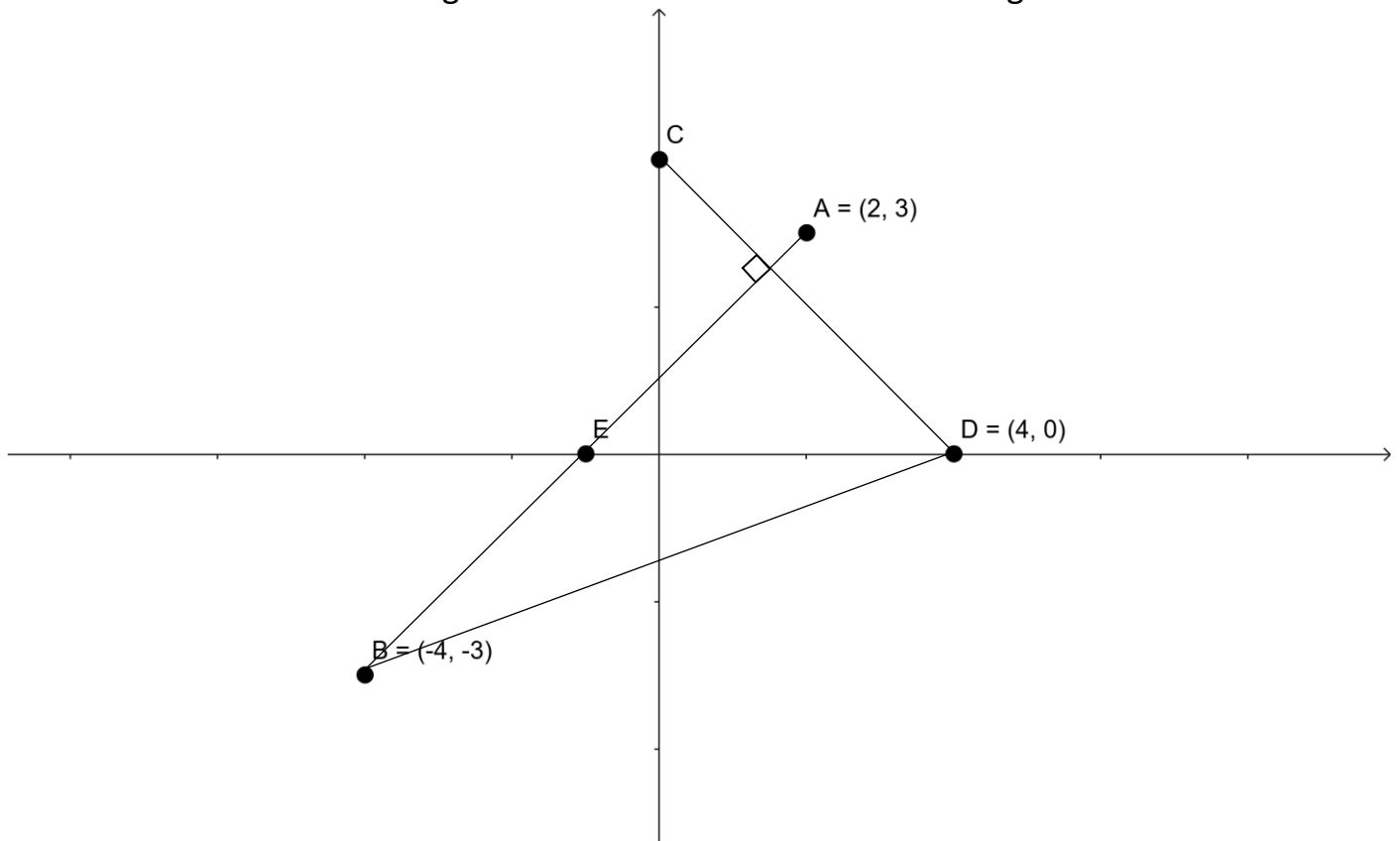
Totaal: 90

Tyd: 2 uur

Kwartaal 2, Junie Eksamen Vraestel 2, 2026 – Memorandum

VRAAG 1

Beskou die onderstaande diagram en beantwoord die vrae wat volg:



1.1 Bepaal die gradiënt van AB.

(2)

$$m = \frac{3 - (-3)}{2 - (-4)} = 1$$

1.2 Bepaal die koördinate van E, die middelpunt van AB. (2)

$$E\left(\frac{2+(-4)}{2}; \frac{3+(-3)}{2}\right)$$

$$E(-1\checkmark; 0\checkmark)$$

1.3 Bepaal die vergelyking van CD. (3)

$$m = -1 [AB \perp CD]\checkmark$$

$$y = -x + c$$

$$0 = -4 + c \checkmark$$

$$4 = c$$

$$y = -x + 4 \checkmark$$

1.4 Bepaal die koördinate van E, sodat BCDE 'n parallelogram vorm. (2)

$$E(0\checkmark; -7\checkmark)$$

1.5 Bepaal die grootte van $\hat{A}BD$. (5)

$$\tan\alpha = m_{AB}$$

$$\tan\alpha = 1 \checkmark$$

$$\alpha = 45^\circ \checkmark$$

$$\tan\beta = m_{AD}$$

$$\tan\beta = \frac{0-(-3)}{4-(-4)} \checkmark$$

$$\beta = 20,56^\circ \checkmark$$

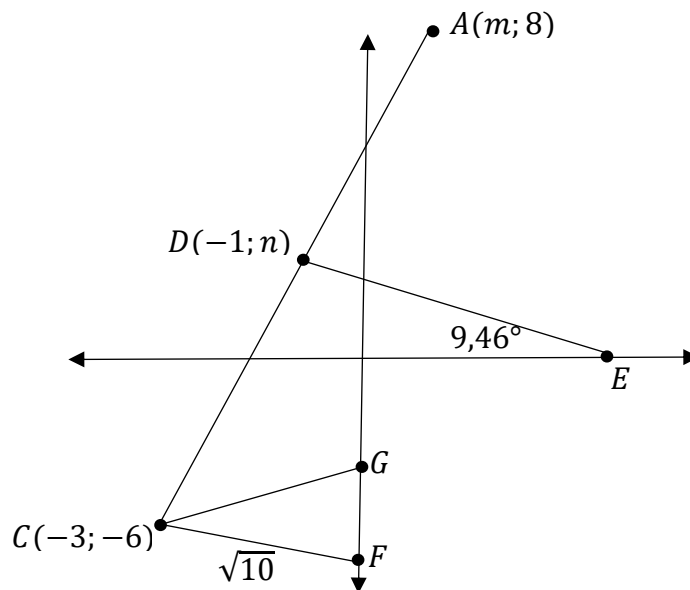
$$\theta = 45^\circ - 20,56^\circ$$

$$\theta = 24,44^\circ \checkmark$$

[14]

VRAAG 2

- 2.1 In die onderstaande diagram is AC en DE lyne wat mekaar sny by D. D is die middelpunt van AC. E is 'n punt op die x-as, sodat DE 'n inklinasiehoek van $9,46^\circ$ het. F en G is 'n punt op die y-as en $CF = \sqrt{10}$ eenhede.



2.1.1 Bewys dat $m = 1$ en $n = 1$.

(2)

$$-1 = \frac{m+(-3)}{2} \checkmark$$

$$-2 = m - 3$$

$$1 = m$$

$$n = \frac{8+(-6)}{2} \checkmark$$

$$n = 1$$

2.1.2 Bepaal die vertikale afstand tussen G en F.

(6)

$$\sqrt{10} = \sqrt{(0 - (-3))^2 + (y - (-6))^2} \checkmark$$

$$10 = 9 + y^2 + 12y + 36 \checkmark$$

$$y^2 + 12y + 35 = 0 \checkmark$$

$$(y + 7)(y + 5) = 0 \checkmark$$

$$y = -7 \text{ en } y = -5 \checkmark$$

$$GF = 2 \text{ eenhede} \checkmark$$

2.2 Gegee: $P(-3; 6)$ en $Q(4; 8)$

Bepaal die vergelyking van die middelloodlyn van PQ.

(6)

$$m_{PQ} = \frac{8-6}{4-(-3)} = \frac{2}{7} \checkmark$$

$$m_{\text{middelloodlyn}} = -\frac{7}{2} \checkmark$$

$$M_{PQ} = \left(\frac{-3+4}{2}; \frac{6+8}{2} \right)$$

$$M_{PQ} = \left(\frac{1}{2}; 7 \right) \checkmark$$

$$7 = -\frac{7}{2} \left(\frac{1}{2} \right) + c \checkmark$$

$$\frac{35}{4} = c \checkmark$$

$$y = -\frac{7}{2}x + \frac{35}{4} \checkmark$$

2.3 Gegee: $A(x; y); B(x + a; y + 3a); C(x + 3a; y + 9a)$, waar $x \neq 0; y \neq 0; a \neq 0$; en $x + a \neq y$.

2.3.1 Bewys dat A, B en C ko-lineêr is.

(4)

$$m_{AB} = \frac{y+3a-y}{x+a-x} = \frac{3a}{a} = 3 \checkmark$$

$$m_{BC} = \frac{y+9a-(y+3a)}{x+3a-(x+a)} = \frac{6a}{2a} = 3 \checkmark$$

$$m_{AC} = \frac{y+9a-y}{x+3a-x} = \frac{9a}{3a} = 3 \checkmark$$

$$\therefore A, B \text{ en } C \text{ is ko-lineêr } [m_{AB} = m_{BC} = m_{AC}] \checkmark$$

2.3.2 Bewys volledig dat $BC = 2AB$.

(6)

$$BC = \sqrt{(x + 3a - (x + a))^2 + (y + 9a - (y + 3a))^2} \checkmark$$

$$BC = \sqrt{4a^2 + 36a^2} \checkmark$$

$$BC = \sqrt{40a^2}$$

$$BC = 2a\sqrt{10} \checkmark$$

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

$$AB = \sqrt{a^2 + 9a^2} \checkmark$$

$$AB = \sqrt{10a^2}$$

$$AB = a\sqrt{10} \checkmark$$

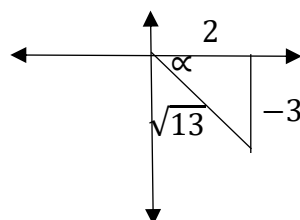
$$\therefore BC = 2AB$$

[24]

VRAAG 3

3.1 Gegee: $\tan \alpha = -\frac{3}{2}$ en $\sin \alpha < 0$

Bepaal elk van die volgende met behulp van 'n diagram en sonder 'n sakrekenaar. (2)



$\sqrt{\text{kwadrant}}$

$\sqrt{\text{skuinssy}}$

$$3.1.1 \sin(90^\circ - \alpha)$$

(1)

$$= \cos \alpha$$

$$= \frac{2}{\sqrt{13}} \sqrt{\quad}$$

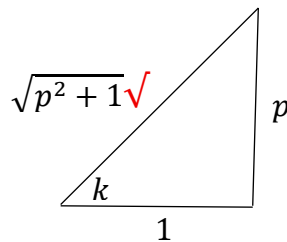
$$3.1.2 \frac{1}{\sin \alpha} \times 2 \cos \alpha$$

(3)

$$= -\frac{\sqrt{13}}{3} \sqrt{\quad} \times 2 \left(\frac{2}{\sqrt{13}}\right) \sqrt{\quad}$$

$$= -\frac{4}{3} \sqrt{\quad}$$

3.2 Indien $\tan k = p$, druk elk van die volgende uit in terme van p :



$\sqrt{\quad}$ diagram met gegewe inligting

$$3.2.1 \sin(-k)$$

(4)

$$= -\sin k \sqrt{\quad}$$

$$= -\frac{p}{\sqrt{p^2 + 1}} \sqrt{\quad}$$

$$3.2.2 3\cos^2(180^\circ - k)$$

(3)

$$= 3\cos^2(-k)$$

$$= 3\cos^2 k \sqrt{\quad}$$

$$= 3\left(\frac{1}{\sqrt{p^2 + 1}}\right)^2 \sqrt{\quad}$$

$$= \frac{3}{p^2 + 1} \sqrt{\quad}$$

[13]

VRAAG 4

4.1 Vereenvoudig volledig sonder die gebruik van 'n sakrekenaar.

$$4.1.1 \frac{-\sin 240^\circ \cdot \cos(-30^\circ)}{\sqrt{3} \tan 330^\circ} + \sin(150^\circ) - \frac{\cos^2 70^\circ}{\sin^2 160^\circ} \quad (10)$$

$$= \frac{-(-\sin 60^\circ \sqrt{3}) \cdot \cos 30^\circ \sqrt{3}}{-\sqrt{3} \tan 30^\circ \sqrt{3}} + \sin 30^\circ \sqrt{3} - \frac{\cos^2 70^\circ}{\sin^2 20^\circ \sqrt{3}}$$

$$= \frac{\frac{\sqrt{3} \cdot \sqrt{3}}{2 \cdot 2} \sqrt{3}}{-\sqrt{3} \times \frac{1}{\sqrt{3}} \sqrt{3}} + \frac{1}{2} \sqrt{3} - \frac{\cos^2 70^\circ}{\cos^2 70^\circ \sqrt{3}}$$

$$= \frac{3}{4} \times -1 + \frac{1}{2} - 1$$

$$= -\frac{5}{4} \sqrt{3}$$

$$4.1.2 \frac{1}{\tan^2(540^\circ + \theta)} \frac{1}{\sin(90^\circ - \theta) \cdot \cos(180^\circ + \theta)} \quad (4)$$

$$= \frac{1}{\tan^2 \theta \sqrt{3}} \frac{1}{\cos \theta \sqrt{3} \cdot \cos \theta \sqrt{3}}$$

$$= \frac{\cos^2 \theta}{\sin^2 \theta} \times \frac{1}{\cos^2 \theta}$$

$$= \frac{1}{\sin^2 \theta} \sqrt{3}$$

4.2 Bewys die volgende identiteit:

$$\frac{\sin \theta}{\sin \theta + 1} - \frac{\sin \theta}{\sin \theta - 1} = \frac{-2 \tan \theta}{\cos \theta} \quad (6)$$

$$= \frac{\sin \theta (\sin \theta - 1) - \sin \theta (\sin \theta + 1)}{(\sin \theta + 1)(\sin \theta - 1) \sqrt{3}}$$

$$= \frac{\sin^2 \theta - \sin \theta \sqrt{3} - \sin^2 \theta - \sin \theta \sqrt{3}}{\sin^2 \theta - 1 \sqrt{3}}$$

$$= \frac{-2 \sin \theta}{\cos^2 \theta \sqrt{3}}$$

$$= \frac{-2 \tan \theta}{\cos \theta} \sqrt{3}$$

4.3 Los op vir θ , indien $3\cos\left(\frac{\theta}{2} - 15^\circ\right) = 2,97$ vir $\theta \in [-180^\circ; 90^\circ]$. (7)

$$\cos\left(\frac{\theta}{2} - 15^\circ\right) = \frac{2,97}{3} \checkmark$$

$$\frac{\theta}{2} - 15^\circ = \cos^{-1}\left(\frac{2,97}{3}\right)$$

$$\frac{\theta}{2} - 15^\circ = 8,11^\circ \checkmark$$

$$1) \frac{\theta}{2} - 15^\circ = 8,11^\circ + 360^\circ k; k \in \mathbb{Z} \checkmark$$

$$\frac{\theta}{2} = 23,11^\circ + 360^\circ k$$

$$\theta = 46,22^\circ + 720^\circ k \checkmark$$

$$4) \frac{\theta}{2} - 15^\circ = 360^\circ - 8,11^\circ + 360^\circ k; k \in \mathbb{Z} \checkmark$$

$$\frac{\theta}{2} = 366,89^\circ + 360^\circ k$$

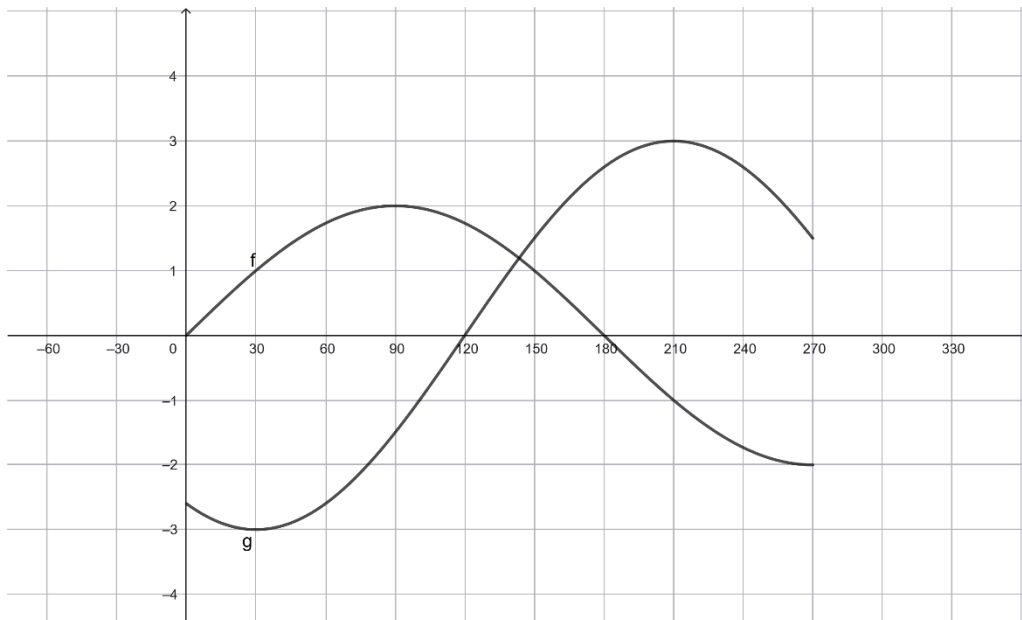
$$\theta = 733,78^\circ + 720^\circ k \checkmark$$

$$\therefore \theta = 13,78^\circ; 46,22^\circ \checkmark$$

[27]

VRAAG 5

5.1 Die onderstaande diagram verteenwoordig $f(x) = a\sin x$ en $g(x) = b\cos(x - c)$ vir $x \in [0^\circ; 270^\circ]$.



5.1.1 Bepaal die waardes van a , b en c .

(3)

$$a = 2 \checkmark$$

$$b = -3 \checkmark$$

$$c = 30^\circ \checkmark$$

5.1.2 Gebruik die grafiek om te bepaal vir watter waarde(s) van x sal

$$f(x) \cdot g(x) < 0.$$

(3)

$$0 < x < 120^\circ \checkmark \text{grense} \cup 180^\circ < x < 270^\circ \checkmark \text{grense}$$

\checkmark notasie van albei intervalle

5.2 Gegee: $f(x) = 2\tan 2x$

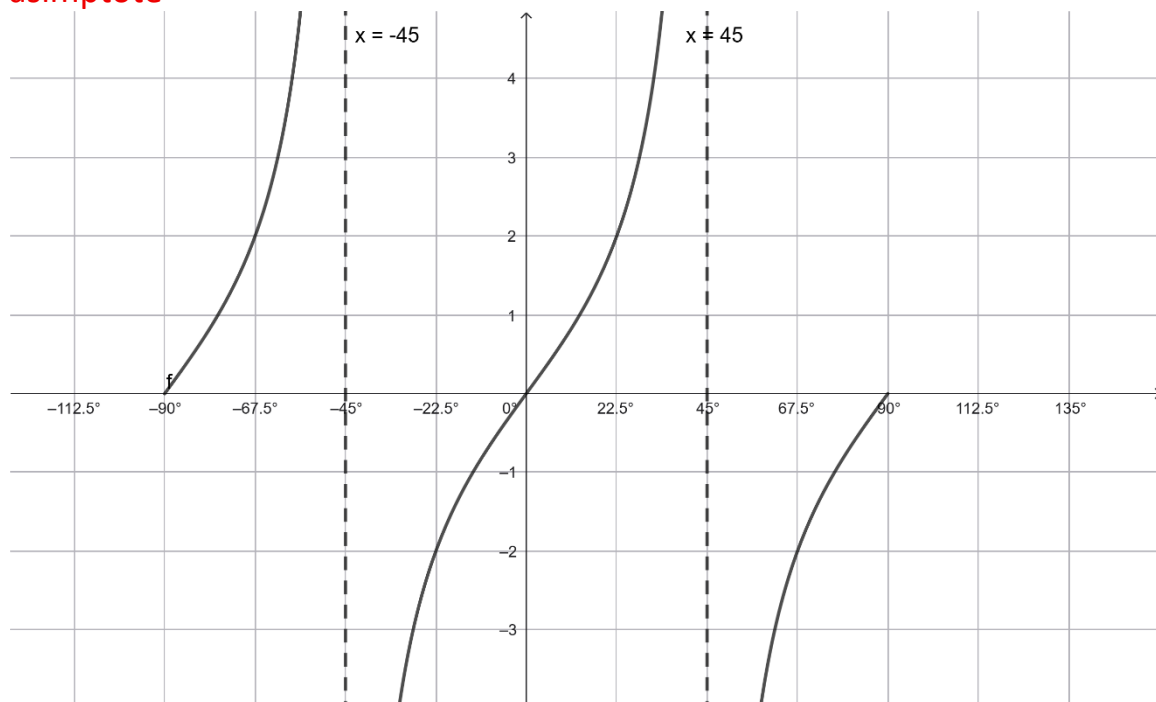
5.2.1 Skets die grafiek van f vir die interval $x \in [-90^\circ; 90^\circ]$. Dui duidelik alle asimptote en afsnitte met die asse aan.

(3)

\checkmark vorm

\checkmark x -afsnitte

\checkmark asimptote



5.2.2 Skryf die periode van f neer.

(1)

$$90^\circ \checkmark$$

5.2.3 Bepaal die periode van $f\left(\frac{3x}{2}\right)$.

(2)

$$f\left(\frac{3x}{2}\right) = 2\tan 2\left(\frac{3x}{2}\right)$$

$$f\left(\frac{3x}{2}\right) = 2\tan 3x \checkmark$$

$$\text{Periode} = \frac{180^\circ}{3} = 60^\circ \checkmark$$

[12]

Totaal: [90]

