GAUTENGSE DEPARTEMENT VAN ONDERWYS

PROVINSIALE EKSAMEN

JUNIE 2016

GRAAD 10

WISKUNDE
(VRAESTEL 2)

MEMORANDUM

7 bladsye

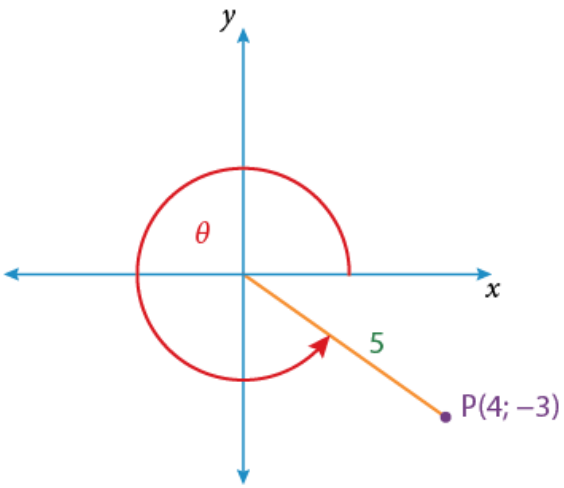
GAUTENGSE DEPARTEMENT VAN ONDERWYS

PROVINSIALE EKSAMEN

WISKUNDE (V2)

MEMORANDUM

	VRAAG 1		
1.1	$\frac{\sin\theta}{\cos\theta} = \frac{y}{r} \div \frac{x}{r}$ $= \frac{y}{r} \times \frac{r}{x}$ $= \frac{y}{x}$	✓verhouding ✓vereenvoudig ✓gevolgtrekking (3)	
1.2.1	$\sin\ \theta = \frac{PQ}{PR} = \frac{5}{13}$	✓antwoord (1)	
1.2.2	$\sec\ \theta = \frac{PR}{QR} = \frac{13}{12}$	✓antwoord (1)	
1.2.3	$\tan\ \theta = \frac{PQ}{QR} = \frac{5}{12}$	✓antwoord (1)	
			[6]

	VRAAG 2		
2.1		✓korrekte kwadrant	
	$4\tan\theta = -3$ $\therefore \tan\theta = -\frac{3}{4} = \frac{y}{x}$ $r^2 = x^2 + y$ $r^2 = (4)^2 + (-3)^2$ $r = 5$	✓ $r = 5$	
	$5\sin\theta + 3\cot\theta$ $= 5\left(\frac{-3}{5}\right) + 3\left(\frac{4}{-3}\right)$ $= -3 - 4 = -7$	✓$\left(\frac{-3}{5}\right)$ ✓$\left(\frac{4}{-3}\right)$ ✓-7 (5)	
2.2	$25\cos^2\theta$ $= 25\left(\frac{4}{5}\right)^2$ $= 25\left(\frac{16}{25}\right)$ $= 16$	✓vervanging ✓antwoord (2)	
			[7]

	VRAAG 3		
3.1.1	$\sin x + 2\cos 3y$ $= \sin(42°) + 2\cos(3 \times 68°)$ $= \sin(42°) + 2\cos 204°$ $= -1{,}16$	Geen penaliseer vir afronding ✓✓antwoord (2)	
3.1.2	$3\tan^2(x + y)$ $= 3\tan^2(42° + 68°)$ $= 3\tan^2 110°$ $= 22{,}65$	Geen penaliseer vir afronding ✓✓antwoord (2)	
3.2.1	$2\sin\theta = 1{,}432$ $\therefore \sin\theta = 0{,}716$ $\therefore \theta = 45{,}725°$	✓ ÷ 2 ✓antwoord (2)	
3.2.2	$\tan 3\theta = 6{,}345$ $3\theta = 81{,}044°$ $\therefore \theta = 27{,}015°$	Penaliseer vir afronding ✓ 3θ ✓ 81,044° ✓antwoord (3)	
		Penaliseer slegs in 3.2.1 of 3.2.2 vir afronding	**[9]**

	VRAAG 4		
4.2			
	$\sin^2 45° - \cos 60° + \tan 10°.\cot 10°$ $= \left(\frac{\sqrt{2}}{2}\right)^2 - \frac{1}{2} + 1$ $= \frac{1}{2} - \frac{1}{2} + 1$ $= 1$	✓ $\sin^2 45° = \frac{1}{2}$ ✓ $\tan 10°.\cot 10° = 1$ ✓ $\cos 60° = \frac{1}{2}$ ✓ antwoord = 1 (4)	
			[9]

	VRAAG 5		
5.1	$\hat{P}_1 + \hat{Q} = \hat{R}_2$ (buitehoek = som van teenoorstaande binnehoeke) $\hat{P}_1 + 30° = 110°$ $\hat{P}_1 = 110° - 30°$ $= 80°$	✓rede ✓antwoord (2)	
5.2	$\hat{P}_2 = \hat{S}_1$ ($\angle^e$ teenoor gelyke sye is gelyk) $\hat{P}_2 + \hat{R}_2 + \hat{S}_1 = 180°$ (Som van $\angle^e$ van 'n driehoek $= 180°$) $\therefore \hat{P}_2 + 110° + \hat{P}_2 = 180°$ (Gegee : $\hat{R}_2 = 110°$ en $\hat{P}_2 = \hat{S}_1$) $\therefore 2\hat{P}_2 = 180° - 110°$ $\therefore 2\hat{P}_2 = 70°$ $\therefore \hat{P}_2 = 35°$ OF $\hat{P}_2 = \hat{S}_1$ ($\angle^e$ teenoor gelyke sye is gelyk) $\hat{R}_1 = \hat{P}_2 + \hat{S}_1$ (buitehoek = som van teenoorstaande binnehoeke) $\therefore \hat{P}_2 = 35°$	✓stelling met rede ✓ stelling met rede ✓vereenvoudiging ✓stelling met rede ✓ stelling met rede ✓vereenvoudiging (3)	
			[5]
	VRAAG 6		
	In ΔABC *en* ΔCDA $\hat{B} = \hat{D}$ (gegee) AC is gemeenskaplik $\hat{C}_1 = \hat{A}_2$ (verwisselende $\angle^e$; AD // BC) $\therefore \Delta ABC \equiv \Delta CDA$ ($\angle; \angle; S$)✓ $\therefore AD = BC$ ✓ ($\Delta ABC \equiv \Delta CDA$) $\therefore$ ABCD is 'n parallelogram (een sy = //) OF In ΔABC *en* ΔCDA $\hat{B} = \hat{D}$ (gegee) AC is gemeenskaplik $\hat{C}_1 = \hat{A}_2$ (verwisselende $\angle^e$; AD // BC) $\therefore \Delta ABC \equiv \Delta CDA$ ($\angle; \angle; S$)✓ $\therefore AD = BC$ ✓ ($\Delta ABC \equiv \Delta CDA$) $\therefore$ AB = DC ✓ ($\Delta ABC \equiv \Delta CDA$) CD is 'n parallelogram teenoorstaande sy =	✓Stelling $\hat{C}_1 = \hat{A}_2$ ✓Rede (AD // BC) ✓S + R ✓AD = BC ✓rede (een sy = //) ✓Stelling $\hat{C}_1 = \hat{A}_2$ ✓Rede (AD // BC) ✓S + R ✓AD = BC ✓rede teenoorstaande sy =	
			[5]

	VRAAG 7		
7.1	AO + OC = $4xy$ (gegee – diagonale halveer) OC = $2xy$ BO + OD = $2x^2 - 2y^2$ (gegee – diagonale halveer) BO = $x^2 - y^2$ LHS = BC^2 $= (x^2 + y^2)^2$ **OF** $= x^4 + 2x^2y^2 + y^4$ RHS = $BO^2 + OC^2$ $= (x^2 - y^2)^2 + (2xy)^2$ $= x^4 - 2x^2y^2 + y^4 + 4x^2y^2$ $= x^4 + 2x^2y^2 + y^4$ **OF** $= (x^2 + y^2)^2$ $\therefore \Delta BOC$ is a reghoekige driehoek OF bewys ΔAOD is n reghoekige driehoek $\therefore$ Diagonale halveer by $90°$ $\therefore \Delta AOD$ is n reghoekige driejhoek	✓ OC = $2xy$ ✓ BO = $x^2 - y^2$ ✓ LK ✓RK ✓rede	
		(5)	
7.2	$\hat{R}_1 = 120°$ (oorstaande hoek van a //^{m}) $\hat{R}_2 = 60°$ (hoeke op 'n reguit lyn) $\hat{T} = 60°$ (hoeke teenoor gelyke sye) $\hat{S}_2 = 60°$ (som van hoeke van 'n driehoek) $\therefore 4x = 60°$ $x = 15°$	✓ $\hat{R}_1 = 120°$ ✓ $\hat{T} = 60°$ ✓ $\hat{S}_2 = 60°$ ✓ $x = 15°$ (4)	**[9]**

TOTAAL: 45