



**GAUTENGSE DEPARTEMENT VAN ONDERWYS**  
**PROVINSIALE EKSAMEN**  
**JUNIE 2016**  
**GRAAD 10**

**WISKUNDE**  
**(VRAESTEL 2)**

**MEMORANDUM**

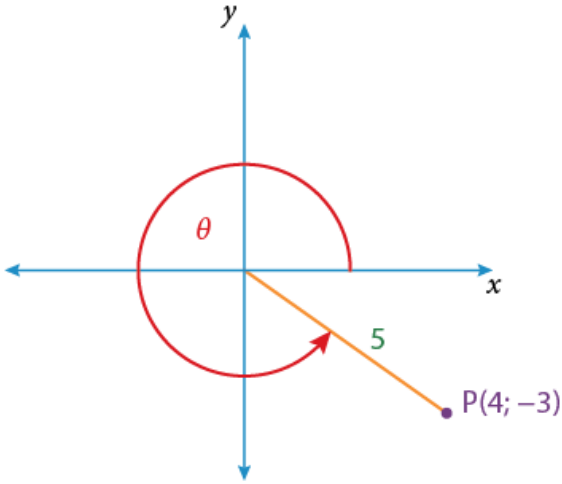
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**PROVINSIALE EKSAMEN**

**WISKUNDE (V2)**

**MEMORANDUM**

	<b>VRAAG 1</b>		
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)	
			<b>[6]</b>

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

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

	<b>VRAAG 4</b>		
4.2			
	$\sin^2 45^\circ - \cos 60^\circ + \tan 10^\circ \cdot \cot 10^\circ$ $= \left( \frac{\sqrt{2}}{2} \right)^2 - \frac{1}{2} + 1$ $= \frac{1}{2} - \frac{1}{2} + 1$ $= 1$	$\checkmark \sin^2 45^\circ = \frac{1}{2}$ $\checkmark \tan 10^\circ \cdot \cot 10^\circ = 1$ $\checkmark \cos 60^\circ = \frac{1}{2}$ $\checkmark \text{antwoord} = 1$ <p style="text-align: right;">(4)</p>	
			<b>[9]</b>

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

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

TOTAAL: 45