



**GAUTENG DEPARTMENT OF EDUCATION /
GAUTENGSE DEPARTEMENT VAN ONDERWYS**

PROVINCIAL EXAMINATION / PROVINSIALE EKSAMEN

JUNE / JUNIE 2019

GRADE / GRAAD 10

MATHEMATICS / WISKUNDE

PAPER / VRAESTEL 2

MEMORANDUM

6 pages / bladsye

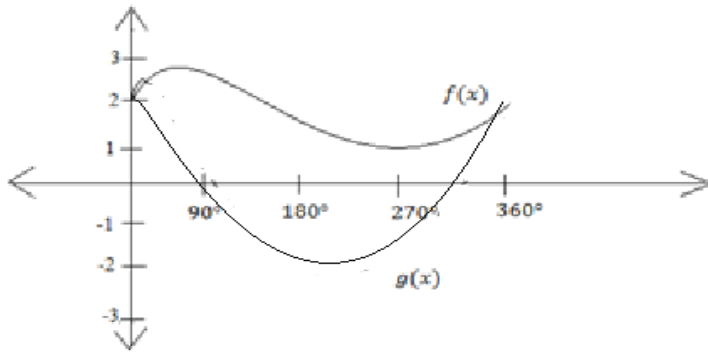
GAUTENG DEPARTMENT OF EDUCATION /
GAUTENGSE DEPARTEMENT VAN ONDERWYSPREPARATORY EXAMINATION /
VOORBEREIDENDE EKSAMENMATHEMATICS / WISKUNDE
(Paper / Vraestel 2)

QUESTION 1 / VRAAG 1										
1.1.1	$\cos \theta$ $= \frac{b}{c}$	$\sqrt{\frac{b}{c}}$ (1)								
1.1.2	$\sin (90^{\circ} - \theta)$ $= \frac{b}{c}$	$\sqrt{\frac{b}{c}}$ (1)								
1.2.1	$r = 5$ $\frac{1}{4} \sin^2 \theta$ $= \frac{1}{4} \left(\frac{-4}{5} \right)^2$ $= \frac{4}{25}$	$\sqrt{\frac{-4}{5}}$ $\sqrt{\frac{4}{25}}$ (2)								
1.2.2	<table><tr><td>LHS / <i>LK</i></td><td>RHS / <i>RK</i></td></tr><tr><td>$\sec^2 \theta - 1$</td><td>$\tan^2 \theta$</td></tr><tr><td>$= \left(\frac{5}{3} \right)^2 - 1$</td><td>$= \left(\frac{-4}{3} \right)^2$</td></tr><tr><td>$= \frac{16}{9}$</td><td>$= \frac{16}{9}$</td></tr></table>	LHS / <i>LK</i>	RHS / <i>RK</i>	$\sec^2 \theta - 1$	$\tan^2 \theta$	$= \left(\frac{5}{3} \right)^2 - 1$	$= \left(\frac{-4}{3} \right)^2$	$= \frac{16}{9}$	$= \frac{16}{9}$	$\sqrt{\left(\frac{5}{3} \right)^2 - 1}$ $\sqrt{\left(\frac{-4}{3} \right)^2}$ $\sqrt{\frac{16}{9}}$ (3)
LHS / <i>LK</i>	RHS / <i>RK</i>									
$\sec^2 \theta - 1$	$\tan^2 \theta$									
$= \left(\frac{5}{3} \right)^2 - 1$	$= \left(\frac{-4}{3} \right)^2$									
$= \frac{16}{9}$	$= \frac{16}{9}$									
		[7]								

QUESTION 2 / VRAAG 2		
2.1	2,34	✓ answer / <i>antwoord</i> (1)
2.2	$\frac{\cos(2\theta - 10^\circ)}{2} = 0,091$ $\cos(2\theta - 10^\circ) = 0,184$ $2\theta - 10^\circ = 79,4^\circ$ $\theta = 44,7^\circ$ ONLY PLACE IN PAPER WHERE LEARNER IS PENALIZED FOR INCORRECT ROUNDING OFF / ENIGSTE PLEK IN VRAESTEL WAAR LEERDER GEPENALISEER WORD VIR VERKEERDE AFRONDING	✓ 79,4° ✓ 44,7° (2)
2.3	$2\sin^2 60^\circ - \sin 45^\circ \cdot \sec 45^\circ + \frac{1}{4}\tan 10^\circ \cdot \cot 10^\circ$ $= 2\left(\frac{\sqrt{3}}{2}\right)^2 - \left(\frac{\sqrt{2}}{2}\right) \cdot \left(\frac{2}{\sqrt{2}}\right) + \frac{1}{4}(1)$ $= 2\left(\frac{3}{4}\right) - 1 + \frac{1}{4}$ $= \frac{3}{4}$	✓ $\frac{\sqrt{3}}{2}$ ✓ $\left(\frac{\sqrt{2}}{2}\right) \cdot \left(\frac{2}{\sqrt{2}}\right)$ ✓ 1 ✓ $\frac{3}{4}$ (4)
		[7]

**QUESTION 3 /
VRAAG 3**

3.1



✓ shape $f(x)$ / vorm $f(x)$
 ✓ turning points $f(x)$ /
 draaipunte $f(x)$

✓ shape $g(x)$ / vorm $g(x)$
 ✓ turning points $g(x)$ /
 draaipunte $g(x)$

(4)

3.2.1

$$y \in [2; -2]$$

OR / OF

$$-2 \leq y \leq 2$$

✓ answer / antwoord

OR/OF

✓ answer / antwoord

(1)

3.2.2

$$90^\circ < x < 270^\circ$$

✓ correct critical values / korrekte
 kritieke waardes
 ✓ correct inequality / korrekte
 ongelykheid

(2)

[7]

**QUESTION 4 /
VRAAG 4**

4.1	Midpoint RS/ <i>Middelpunt RS</i> = (2;1)	✓ 2 ✓ 1 (2)
4.2	$\frac{-2+x}{2} = 2 \quad \frac{1+y}{2} = 1$ $x=6 \quad y=1$ $T(6;1)$	✓ $\frac{-2+x}{2} = 2$ and / en $\frac{1+y}{2} = 1$ ✓ $x=6$ ✓ $y=1$ (3)
4.3	$RU = \sqrt{(2+2)^2 + (5-1)^2}$ $= \sqrt{32}$	✓ $\sqrt{(2+2)^2 + (5-1)^2}$ ✓ $\sqrt{32}$ (2)
4.4	$M_{RU} = \frac{1-5}{-2-2} \quad M_{SP} = \frac{y+3}{x-2} = 1$ $=1 \quad y=x-5$ $SP = \sqrt{(x-2)^2 + (y+3)^2} = 2\sqrt{32}$ $\sqrt{x^2 - 4x + 4 + y^2 + 6y + 9} = 2\sqrt{32}$ $x^2 - 4x + 13 + (x-5)^2 + 6(x-5) = 128$ $2x^2 - 8x - 90 = 0$ $x^2 - 4x - 45 = 0$ $(x-9)(x+5) = 0$ $x=9 \quad \text{or / of} \quad x=-5$ $y=9-5 \quad y=-5-5$ $y=4 \quad y=-10$ $P(9;4) \quad P(-5;-10)$	✓ $M_{RU} = 1$ ✓ $y=x-5$ ✓ $\sqrt{(x-2)^2 + (y+3)^2}$ ✓ 128 ✓ substitute / <i>vervang</i> ✓ $x^2 - 4x - 45 = 0$ ✓ $x=9 ; x=-5$ ✓ $y=4 ; y=-10$ (8)
		[15]

**QUESTION 5 /
VRAAG 5**

5.1	parallelogram		✓ answer / <i>antwoord</i> (1)
5.2.1	$E_1 = x$ $E_3 = 2x$ $x + 90^\circ + 2x = 180^\circ$ $x = 30^\circ$	$\angle$'s opp equal sides / $\angle$ 'e teenoor gelyke sye $\angle$'s opp equal sides / $\angle$ 'e teenoor gelyke sye $\angle$'s straight line / $\angle$ 'e op reguityn	✓ S/R ✓ S ✓ S ✓ S (4)
5.2.2	$A = 120^\circ$ $C_1 = 60^\circ$ $C_2 = 60^\circ$ $\therefore A = C$ ABCD is a parm	sum $\angle$'s Δ / <i>som vd $\angle$'e Δ</i> sum $\angle$'s Δ / <i>som vd $\angle$'e Δ</i> alt $\angle$'s AD BC/ <i>verwis $\angle$'e AD BC</i> opp $\angle$'s equal / <i>oorst $\angle$'e gelyk</i>	✓ S ✓ R ✓ S ✓ R (4)
[9]			

**QUESTION 6
VRAAG 6**

	$AO = OC = 2xy$ $BO = OD = x^2 - y^2$ $BO^2 + OC^2$ $= (x^2 - y^2)^2 + (2xy)^2$ $= x^4 - 2x^2y^2 + y^4 + 4x^2y^2$ $= x^4 + 2x^2y^2 + y^4$ $= (x^2 + y^2)^2$ BC^2 $= (x^2 + y^2)^2$ $\therefore BC^2 = BO^2 + OC^2$ $BOC = 90^\circ$ ABCD is a rhombus / <i>is 'n ruit</i>	given / <i>gegee</i> given / <i>gegee</i> pythagoras diagonals bisect at 90° / <i>diagonale halveer 90°</i>	✓ $AO = OC = 2xy$ $BO = OD = x^2 - y^2$ ✓ $(x^2 - y^2)^2 + (2xy)^2$ ✓ $(x^2 + y^2)^2$ ✓ S/R ✓ R (5)
[5]			
TOTAL / TOTAAL: 50			