

**GAUTENG DEPARTMENT OF EDUCATION  
PROVINCIAL EXAMINATION  
JUNE 2016  
GRADE 10**

**MATHEMATICS  
(PAPER 2)**

**MEMORANDUM**

**7 pages**

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PROVINCIAL EXAMINATION

MATHEMATICS (P2)

MEMORANDUM

QUESTION 1			
1.1	$\frac{\sin\theta}{\cos\theta} = \frac{y}{r} \div \frac{x}{r}$ $= \frac{y}{r} \times \frac{r}{x}$ $= \frac{y}{x}$	$\checkmark \frac{y}{r}$ $\checkmark \frac{x}{r}$ $\checkmark$ simplification (3) Answer only 1/3	
1.2.1	$\sin \theta = \frac{PQ}{PR} = \frac{5}{13}$	$\checkmark$ answer (1)	
1.2.2	$\sec \theta = \frac{PR}{QR} = \frac{13}{12}$	$\checkmark$ answer (1)	
1.2.3	$\tan \theta = \frac{PQ}{QR} = \frac{5}{12}$	$\checkmark$ answer (1)	
			<b>[6]</b>

QUESTION 2			
2.1		<p>✓ correct quadrant</p>	
	$4 \tan \theta = -3$ $\therefore \tan \theta = -\frac{3}{4} = \frac{y}{x}$ $r^2 = x^2 + y^2$ $r^2 = (4)^2 + (-3)^2$ $r = 5$	<p>✓ <math>r = 5</math></p>	
	$5 \sin \theta + 3 \cot \theta$ $= 5 \left( \frac{-3}{5} \right) + 3 \left( \frac{4}{-3} \right)$ $= -3 - 4 = -7$	<p>✓ <math>\left( \frac{-3}{5} \right)</math></p> <p>✓ <math>\left( \frac{4}{-3} \right)</math></p> <p>✓ <math>-7</math></p> <p>(5)</p>	
2.2	$25 \cos^2 \theta$ $= 25 \left( \frac{4}{5} \right)^2$ $= 25 \left( \frac{16}{25} \right)$ $= 16$	<p>✓ substitution</p> <p>✓ answer</p> <p>(2)</p>	
			[7]

QUESTION 3			
3.1.1	$\sin x + 2 \cos 3y$ $= \sin(42^\circ) + 2 \cos(3 \times 68^\circ)$ $= \sin(42^\circ) + 2 \cos 204^\circ$ $= -1,16$	Do not penalise for rounding off  $\checkmark\checkmark$ answer (2)	
3.1.2	$3 \tan^2(x + y)$ $= 3 \tan^2(42^\circ + 68^\circ)$ $= 3 \tan^2 110^\circ$ $= 22,65$	Do not penalise for rounding off  $\checkmark\checkmark$ answer (2)	
3.2.1	$2 \sin \theta = 1,432$ $\therefore \sin \theta = 0,716$ $\therefore \theta = 45,725^\circ$	Do not penalise for rounding off  $\checkmark\checkmark$ answer (2)	
3.2.2	$\tan 3\theta = 6,345$ $3\theta = 81,044^\circ$ $\therefore \theta = 27,015^\circ$	$\checkmark \tan^{-1}$ $\checkmark \div 3$ $\checkmark$ answer (3)	
		*penalise once only for rounding off in 3.2	<b>[9]</b>

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

QUESTION 5			
5.1	$\hat{P}_1 + \hat{Q} = \hat{R}_2$ (exterior angle = sum of interior opposite angles) $\hat{P}_1 + 30^\circ = 110^\circ$ $\hat{P}_1 = 110^\circ - 30^\circ$ $= 80^\circ$	✓ reason  ✓ answer	(2)
5.2	$\hat{P}_2 = \hat{S}_1$ ( $\angle^s$ opposite equal sides are equal) $\hat{P}_2 + \hat{R}_2 + \hat{S}_1 = 180^\circ$ (Sum of $\angle^s$ of a triangle = $180^\circ$ ) $\therefore \hat{P}_2 + 110^\circ + \hat{P}_2 = 180^\circ$ (Given : $\hat{R}_2 = 110^\circ$ and $\hat{P}_2 = \hat{S}_1$ ) $\therefore 2\hat{P}_2 = 180^\circ - 110^\circ$ $\therefore 2\hat{P}_2 = 70^\circ$ $\therefore \hat{P}_2 = 35^\circ$ <b>OR</b> $\hat{P}_2 = \hat{S}_1$ ( $\angle^s$ opposite equal sides are equal) $\hat{R}_1 = \hat{P}_2 + \hat{S}_1$ (exterior angle = sum of interior opposite angles) $\therefore \hat{P}_2 = 35^\circ$	✓ statement and reason  ✓ statement and reason  ✓ simplification  <b>OR</b> ✓ statement and reason  ✓ statement and reason  ✓ simplification	(3)
			[5]
QUESTION 6			
	In $\triangle ABC$ and $\triangle CDA$ $\hat{B} = \hat{D}$ (given) AC is common $\hat{C}_1 = \hat{A}_2$ (alternate angles ; AD // BC ) $\therefore \triangle ABC \equiv \triangle CDA$ ( $\angle$ ; $\angle$ ; S ) $\therefore AD = BC$ ( $\triangle ABC \equiv \triangle CDA$ ) $\therefore$ ABCD is a parallelogram ( one side = // )  <b>OR</b> In $\triangle ABC$ and $\triangle CDA$ $\hat{B} = \hat{D}$ (given) AC is common $\hat{C}_1 = \hat{A}_2$ (alternate angles ; AD // BC ) $\therefore \triangle ABC \equiv \triangle CDA$ ( $\angle$ ; $\angle$ ; S ) $\therefore AD = BC$ ( $\triangle ABC \equiv \triangle CDA$ ) $\therefore AB = DC$ ( $\triangle ABC \equiv \triangle CDA$ )  $\therefore$ ABCD is a parallelogram ( opposite sides = )	✓ $\hat{C}_1 = \hat{A}_2$  ✓ Reason (AD // BC)  ✓ S + R ✓ AD = BC ✓ reason ( one side = // )  <b>OR</b> ✓ Statement  ✓ Reason (AD // BC)  ✓ S + R ✓ AD = BC ✓ reason (opposite sides =)	

			[5]

