Education and Sport Development

Department of Education and Sport Development
Departement van Onderwys en Sportontwikkeling
Lefapha la Thuto le Tlhabololo ya Metshameko
NORTH WEST PROVINCE

PROVINCIAL ASSESSMENT

GRADE 11

TECHNICAL MATHEMATICS P2
JUNE 2019

MEMORANDUM

MARKS: 100

This memorandum consists of 7 pages.

Question 1

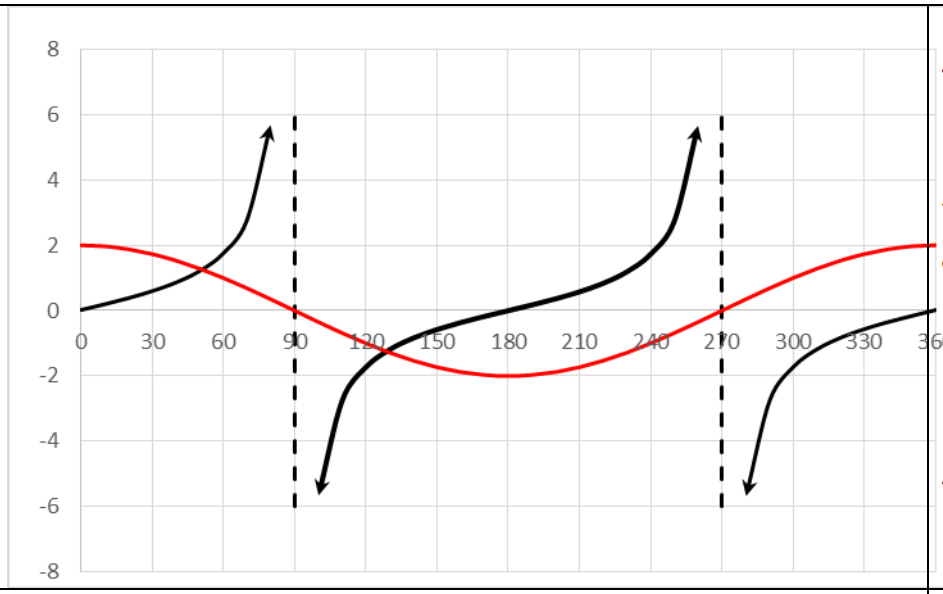
1.1	$y = 3$	✓ *answer*
1.2	$M_{PQ} = \left(\frac{x_1 + x_2}{2}; \frac{y_1 + y_2}{2}\right)$ $= \left(\frac{3 + (-3)}{2}; \frac{3 + (-2)}{2}\right)$ $= \left(0; \frac{1}{2}\right)$	✓ *substitution* ✓ *Answer* *AO full marks*
1.3	$M_{PR} = \frac{y_2 - y_1}{x_2 - x_1}$ $= \frac{3 - (-2)}{-4 - (3)}$ **OR** $= \frac{3 - (-2)}{-4 - (-3)}$ $= -5$ $\theta = \tan^{-1}(-5)$ $= -78.69$ $= 180 - 78.69$ $= 101.31°$	✓ *substitution* ✓ -5 ✓ -78.69 ✓ $101.31°$
1.4	$\theta = 101.31°$ $M_{QR} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - (-2)}{3 - (-3)} = \frac{5}{6}$ $\beta = \tan^{-1}\left(\frac{5}{6}\right) = 39.81°$ $\hat{R} + 39.81° = 101.31°$ *extr* $\angle\Delta$ $\hat{R} = 61.50°$	✓ $39.81°$ ✓✓ *S and R* ✓ *Answer*
1.5	$M_{QR} \times M_{line} = -1$ $\frac{5}{6} \times -\frac{6}{5} = -1$ $\therefore M_{line} = -\frac{6}{5}$ $\frac{1}{2} = -\frac{6}{5}(0) + c$ $c = \frac{1}{2}$ $y = -\frac{6}{5}x + \frac{1}{2}$	✓ $M_{QR} \times M_{line} = -1$ ✓ $M_{line} = -\frac{6}{5}$ ✓ *Sub* $(0; \frac{1}{2})$ ✓ *answer*
1.6	$M_{PR} = -5$ $y = -5x + c$ $-2 = -5(-3) + c$	✓ $M_{PR} = -5$ ✓

	$c = -17$ $y = -5x - 17$	$Sub.(-3;-2)$ ✓ $answer$
1.7	No, $M_{PR} \times M_{QR} \neq -1$	✓ No ✓ $M_{PR} \times M_{QR} \neq -1$

QUESTION 2

2.1.1	$y^2 + x^2 = r^2$ $(3)^2 + (4)^2 = r^2$ $r^2 = 25$ $r = 5$ $\therefore OT = 5$	✓ $Pythagoras$ ✓ $Substitution$ ✓ $OT = 5$
2.1.2	$5cos\beta - 4tan\beta$ $= 5\left(\frac{4}{5}\right) - 4\left(\frac{3}{4}\right)$ $= 1$	✓ $Sub\ cos\beta$ ✓ $Sub\ sin\beta$ ✓ $answer$
2.1.3	$cosec\beta = \frac{1}{\sin\beta} = 1 \div \left(\frac{3}{5}\right) = \frac{5}{3}$	✓ $\frac{1}{\sin\beta}$ ✓ $answer$
2.1.4	$cot\beta = \frac{\cos\beta}{\sin\beta} = \left(\frac{4}{5}\right) \div \left(\frac{3}{5}\right) = \frac{4}{3}$	✓ $\frac{\cos\beta}{\sin\beta}$ ✓ $answer$
2.1.5	$sec^2\beta = \frac{1}{cos^2\beta} = 1 \div \left(\frac{4}{5}\right)^2 = \frac{25}{16}$	✓ $\frac{1}{cos^2\beta}$ ✓ $answer$
2.2.1	$\sin(p+q) = \sin(62+28) = 1$	✓ $sub.p\ amd\ q$ ✓ $answer$
2.2.2	$5cos28 + \frac{sin62}{2} = 4.86$	✓ sub ✓ $answer$

QUESTION 3

3.1		$f(x)$ ✓ *asymptotes* ✓ *x and y inter* $g(x)$ ✓ *shape* ✓ *x and y inter* $f(x)$ ✓ *turning pt*
3.2	$f = 180°$ $g = 360°$	✓ *answer* ✓ *answer*
3.3	$a = 2$	✓ *answer*
3.4	$-2 \leq y \leq 2$	✓ *end points* ✓ *notation*

QUESTION 4

4.1.1	Are supplementary	✓ *answer*
4.1.2	Bisect the chord	✓ *answer*
4.2.1	$\hat{C} = 90°$ $\angle subtended\ by\ a\ diameter$	✓ *Reason*
4.2.2	$\widehat{B_1} = 60°$ $alt\angle's\ AB \parallel DC$	✓ *Reason* ✓ *Statement*
4.2.3	$\hat{E} + \widehat{B_1} = 180°$ $opp\ \angle's\ cyclic\ quad$	✓ *Reason*

		✓ *Statement*
4.2.4	$\widehat{D} = 180 - (60 + 90) = 30$ *sum of ∠'s Δ*	✓ *Reason* ✓ *Statement*
4.3.1	$\hat{A} + A\hat{E}D = 180°$ *co − interior ∠'s AB ∥ ED*	✓ *Statement* ✓ *Reason*
4.3.2	$\hat{B}_1 = 70°$ *extr ∠ cyclic quard*	✓ *Statement* ✓ *Reason*
4.3.3	$\hat{B}_1 = \hat{D}_2 = 70°$ *Alt ∠'s DE ∥ CA*	✓ *Statement* ✓ *Reason*
4.3.4	$\hat{B}_2 = \hat{D}_2 = 70°$ *∠'s opp = sides*	✓ *Reason* ✓ *Statement*
4.3.5	$\widehat{E_1} = 180 - (\hat{B}_2 + \hat{D}_2)$ *sum of ∠'s Δ* $= 180 - 140$ $= 40$ $\widehat{D_1} = E_1 = 40$ tan *chord theorem*	✓ *Statement* ✓ *sub* ✓ *answer*

QUESTION 5

5.1.1	$OB = x + 8$	✓ *answer*
5.1.2	$OD^2 + BD^2 = OB^2$ $(x)^2 + (12)^2 = (x + 8)^2$ $x^2 + 144 = x^2 + 16x + 64$ $16x + 64 = 144$ $x = 5$ $OB = 5 + 8 = 13$	✓ *sub* ✓ *simplification* ✓ *answer* ✓ *answer*
5.2.1	(a) $\hat{A} = 61°$ tan *chord theorem* (b) $\hat{M} = 61°$ tan *chord theorem*	✓✓ *S and R* ✓✓ *S and R*
5.2.2	Vertically opposite angles	✓ *S*

QUESTION 6

6.1	$160° \times \frac{\pi}{180} = \frac{8}{9}\pi$	✓ *answer*
6.2	$\frac{\pi}{60} \times \frac{180}{\pi} = 3°$	✓ *answer*
6.3	$134°\,15'\,3.6'$	✓✓ *answer*
6.4	$27.615°$	✓✓ *answer*
6.5	$\frac{\pi}{2} + \frac{7\pi}{3} = \frac{17\pi}{6} \times \frac{180}{\pi} = 510°$ ***OR*** $\frac{\pi}{2} \times \frac{180}{\pi} + \frac{7\pi}{3} \times \frac{180}{\pi} = 510°$	✓✓$\frac{17\pi}{6}$ ✓$\frac{180}{\pi}$ ✓$510°$ ✓$\frac{\pi}{2} \times \frac{180}{\pi}$ ✓$\frac{7\pi}{3} \times \frac{180}{\pi}$ ✓✓$510°$ *AO FULL MARKS*
6.6	$\sin\pi + \cos\frac{\pi}{4}$ $= 0.05 + 1.00$ $= 1.05$	✓0.05 ✓1.00 ✓✓*answer* *AO FULL MARKS*

QUESTION 7

7.1	*E is on AD and B is on AC* $EB \parallel DC$ $A\hat{E}B = E\hat{D}C$ *Corres ∠, EB ∥ DC* $A\hat{B}E = B\hat{C}D$ *Corres ∠, EB ∥ DC* $\Delta AEB /// \Delta ADC$ *∠∠∠* $\frac{AB}{AC} = \frac{EB}{DC}$ $\frac{AB}{24} = \frac{6}{9}$ $AB = 16$	✓ *S/R* ✓ *S/R* ✓*∠∠∠* ✓ *Substitution* ✓ *answer*
7.2	$\frac{AE}{AD} = \frac{EB}{DC}$ $\Delta AEB /// \Delta ADC$, $EB \parallel DC$ $\frac{10}{AD} = \frac{6}{9}$ $AD = 15\ Units$ $ED = AD - AE$ $= 15 - 10$ $= 5\ units$	✓ *S/R* ✓ *Substitution* ✓*answer* ✓ *Substitution* ✓ *answer*
		TOTAL[100]

QUES	TOPIC	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
1.1	ANALYTICAL GEOMETRY	1			
1.2			2		
1.3			4		
1.4				4	
1.5					4
1.6			3		
1.7			2		
TOTAL	**[20]**	**1**	**11**	**4**	**4**
2.1.1	TRIGONOMETRY		3		
2.1.2				3	
2.1.3					2
2.1.4					2
2.1.5					2
2.2.1		2			
2.2.2		2			
TOTAL	**[16]**	**4**	**3**	**3**	**6**
3.1	TRIGONOMETRY			5	
3.2		2			
3.3		1			
3.4			2		
TOTAL	**[10]**	**3**	**2**	**5**	**0**
4.1.1	EUCLIDEAN GEOMETRY	1			
4.1.2		1			
4.2.1		1			
4.2.2			2		
4.2.3			2		
4.2.4			2		
4.3.1			2		
4.3.2		2			
4.3.3			2		
4.3.4		2			
4.3.5				3	
TOTAL	**[20]**	**7**	**10**	**3**	**0**
5.1.1	EUCLIDEAN GEOMETRY	1			
5.1.2				4	
5.2.1 (a)			2		
5.2.1 (b)			2		
5.2.2		1			
TOTAL	**[10]**	**2**	**4**	**4**	**0**
6.1	TRIGONOMETRY	1			
6.2		1			
6.3			2		
6.4				2	
6.5		4			
6.6		4			
TOTAL	**[14]**	**10**	**2**	**2**	**0**
7.1	EUCLIDEAN GEOMETRY				5
7.2					5
TOTAL	**[10]**	**0**	**0**	**0**	**10**
GRAND TOTAL	**100**	**27**	**32**	**21**	**20**
%	**100%**	**27%**	**32%**	**21%**	**20%**
%CAPS	**100%**	**25%**	**45%**	**20%**	**10%**