Education and Sport Development

Department of Education and Sport Development
Departement van Onderwys en Sport Ontwikkeling
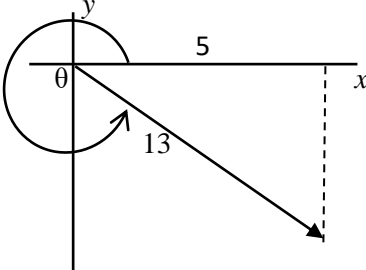Lefapha la Thuto le Tlhabololo ya Metshameko

NORTH WEST PROVINCE

GRADE 10
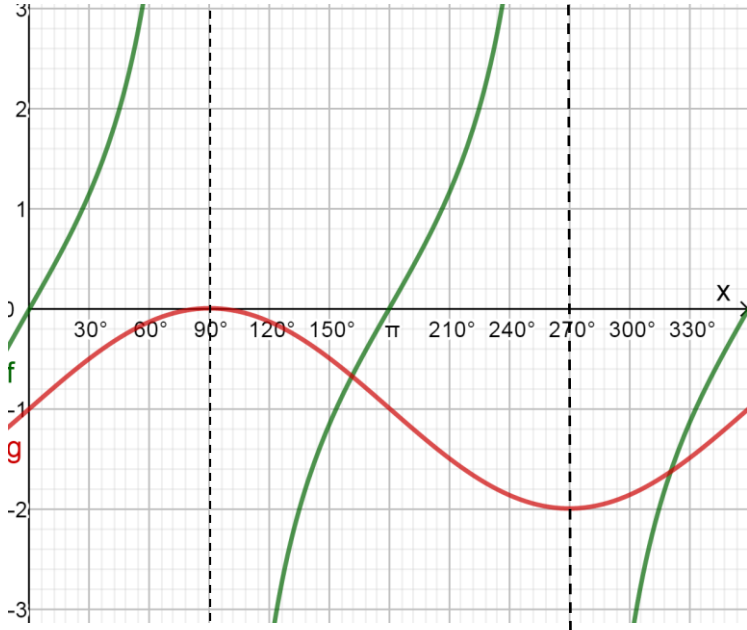
TECHNICAL MATHEMATICS P2
MID-YEAR EXAMINATION 2018

MARKING GUIDELINE

MARKS: 75

This marking guideline consists of 6 pages.

QUESTION 1		
1.1.1	$\sin \alpha = \frac{3}{5}$	✓answer (1)
1.1.2	$\sec \alpha = \frac{5}{4}$	✓ answer (1)
1.2.1	$\sin (62° + 28°)$ $= \sin 90°$ $= 1$	✓ substitution ✓ answer (2)
1.2.2	$5 \cot 28° + \dfrac{\sin 62°}{2}$ $= 9{,}845106123$ $\approx 9{,}85$	✓ substitution ✓ answer (2)
1.3.1	$3 \cos x = 1{,}5$ $\cos x = ½$ $x = 60°$	 ✓ $\cos x = \frac{1{,}5}{3}$ ✓ answer (2)
1.3.2	$\tan (2x + 15°) = 3$ $2x + 15° = 71{,}56505118°$ $2x = 56{,}56505118°$ $x = 28{,}28252559°$ $x \approx 28°$	 ✓ $2x + 15°$ $= 71{,}56505118°$ ✓ answer (2)
1.4.1	$\cos \theta = \frac{5}{13}$ $y^2 = 13^2 - 5^2$ $= 144$ $y = -12$ $\cot \theta = -\frac{5}{12} = \frac{-5}{12}$	✓ $\cos \theta = \frac{5}{13}$ ✓ correct quadrant ✓ $y = -12$ ✓ $\cot \theta = \frac{5}{-12}$ (4)

1.4.2	$\sin \theta + \cos \theta$		
	$= \frac{-12}{13} + \frac{5}{13}$	✓ substitution	
	$= -\frac{7}{13}$	✓ answer (2)	
		[16]	

QUESTION 2

2.1.1	$\frac{AB}{BC} = \tan 32,01°$	✓ correct ratio (tan)
	$\frac{AB}{8} = \tan 32,01°$	✓ substitution
	$AB \approx 5$ m	✓ answer (3)

2.1.2	$\frac{AC}{BC} = \sec 32,01°$	✓ substitution
	$\frac{AC}{8} = \sec 32,01°$	✓ answer
	$AC = 9,434456295$	(2)
	$AC \approx 9,43$ m	
	OR	**OR**
	$AC^2 = AB^2 + BC^2$	✓ substitution
	$AC^2 = (5)^2 + 8^2$	✓ answer
	$AC^2 = 89$	(2)
	$AC \approx 9,43m$	

2.2.1	$\cos 6,5^0 = \dfrac{100}{AD}$	✓ $\cos 6,5^0 = \dfrac{100}{AD}$
	$AD = \dfrac{10}{\cos 6,5^0}$	✓ $AD = \dfrac{10}{\cos 6,5^0}$
	$AD = 100,65m$	✓ answer (3)

2.2.2	$\tan 6,5^0 = \dfrac{CD}{100}$	✓ $\tan 6,5^0 = \dfrac{CD}{100}$
	$CD = 11,39m$	✓ $CD = 11,39m$
	$\tan 18,7^0 = \dfrac{BC}{100}$	✓ $BC = 33,85m$
	$BC = 33,85m$	✓ answer
	$\therefore$ Height of building = 11,39 m	(4)

2.2.3		
	Area of ABD $= \dfrac{1}{2}$ base $\times$ height	✓formula
	$= \dfrac{1}{2}(45{,}24)(100)$	✓substitution
	$= 2\,262\,\text{m}^2$	✓answer (3)
		[16]
	QUESTION 3	
3.1		✓ *f(x)* asymptotes ✓x axis ✓y axis ✓ *g(x)* shape ✓x axis ✓y axis (6)
3.2	$y \in [-2;0]$ or $-2 \le y \le 0$	✓ notation ✓ end points/ extreme vlaues (2)
3.3	$x = 0^o$ and $x = 180^o$	✓$x = 0^o$ ✓$x = 180^o$ (2)
3.4	$90^o < x < 162^o$	✓extreme values ✓ notation (2)
		[12]
	QUESTION 4	
4.1.1	$x = 53^o$ [alt $\angle$'s, PQ//RS]	✓ $x = 53^o$ ✓ reason (2)
4.1.2	$y = 180^o - 104^o$ [co int. $\angle$'s, PQ//RS] $= 76^o$	✓ $y = 76^o$ ✓ reason (2)
4.1.3	$z = 180^o - 149^o$ [$\angle$'s on a str. Line] $= 31^o$	✓$z = 31^o$ ✓ reason (2)
4.2.1	$B\hat{A}D = 180^o - 65^o$ [co int. $\angle$'s, AB//DC] $= 115^o$	✓ $B\hat{A}D = 115^o$ ✓ reason (2)
4.2.2	$B\hat{C}D = 115^o$ [co int. $\angle$'s, AB//DC]	✓statement + reason

	$x + 2x + 5 + 115^o = 180^o$ [∠'s on str. Line] $3x = 60^o$ $x = 20^o$ **OR** $x + 2x + 5 = 65^o$ [alt ∠'s, AB//DC] $3x = 60^o$ $x = 20^o$	✓ x = 20º (2) **OR** ✓ statement + reason ✓ x = 20º (2)

4.2.3	$B\hat{C}F = x + 2x + 5^0$
	
	       $= 3x + 5^0$
	
	       $= 3(20^0) + 5^0$
	
	       $= 65^0$
	
	OR
	
	    $B\hat{C}F = 65°$ [corresp/Alt ∠s ; AB//DC]
		✓ method
		✓ answer
		
		✓Statement ✓Reason
		(2)

		[12]
QUESTION 5		
5.1	SAS SSS AAS RHS	✓any one of the reasons (1)
5.2.1	HĜF = 360º - 243,43º [rotation]or [angles around a point] = 166,57º	✓reason ✓answer (2)
5.2.2	In ΔHEF and ΔHFG Ê = HĜF both = 166,57º EĤF = HF̂G alt. ∠'s, EH//FG HF = HF common side HEF ≡ ΔHFG ∠;∠;S	✓statement + reason ✓statement + reason ✓statement + reason ✓statement + reason (4)
5.2.3	EFGH is a //ᵐ One pair of opposite <'s are equal and opposite sides are = (from Congruency)	✓ //ᵐ ✓reason (2)
QUESTION 6		
6.1	E is on AD and B is on AC EB//DC given AÊB = ED̂C [corresponding ∠, ,EB//DC] AB̂E = BĈD [corresponding ∠, ,EB//DC]	✓ proving similarity

	$\Delta AEB \mathbin{///} \Delta ADC;$ $[\angle, \angle, \angle]$ $\frac{AB}{AC} = \frac{EB}{DC}$ $\frac{AB}{24} = \frac{6}{9}$ AB = 16	$\checkmark$ $\Delta AEB \mathbin{///} \Delta ADC$ $\checkmark \frac{AB}{AC} = \frac{EB}{DC}$ $\checkmark$ substitution $\checkmark$ answer (5)

6.2	$\frac{AE}{AD} = \frac{EB}{DC}$ $\Delta AEB \mathbin{///} \Delta ADC;$ EB//DC
	
	 $\frac{10}{AD} = \frac{6}{9}$
	
	 AD = 15 units
	
	 ED = AD – AE
	      = 15 – 10
	      = 5
		$\checkmark$ Statement and reason
		
		 $\checkmark$ substitution
		
		 $\checkmark$ answer AD
		
		 $\checkmark$ subtraction
		 $\checkmark$ answer
		 (5)

		TOTAL 75

TAXONOMY LEVELS

QUES	TOPIC	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
1.1.1	Trigonometry	1			
1.1.2		1			
1.2.1			2		
1.2.2			2		
1.3.1			2		
1.3.2			2		
1.4.1				4	
1.4.2			2		
TOTAL	**[16]**	**2**	**10**	**4**	**0**
2.1.1	Trigonometry	3			
2.1.2		3			
2.2.1			3		
2.2.2			3		
2.2.3		2			
2.2.4		2			
TOTAL	**[16]**	**10**	**6**	**0**	**0**
3.1	Trigonometry		6		
3.2			2		
3.3		2			
3.4			2		
TOTAL	**[12]**	**2**	**10**	**0**	**0**
4.1.1	Euclidean geometry		2		
4.1.2			2		
4.1.3			2		
4.2.1			2		
4.2.2				2	
4.2.3				2	
TOTAL	**[12]**	**0**	**8**	**4**	**0**
5.1	Euclidean geometry	1			
5.2.1			2		
5.2.2			4		
5.2.3		2			
TOTAL	**[9]**	**3**	**6**	**0**	**0**
6.1	Euclidean geometry			5	
6.2					5
TOTAL	**[10]**	**0**	**0**	**5**	**5**
GRAND TOTAL	**75**	**17**	**40**	**13**	**5**
%	**100 %**	**23%**	**53%**	**17%**	**7%**
CAPS %	**100 %**	25 %	45%	20%	10%