Education and Sport Development

Department of Education and Sport Development
Departement van Onderwys en Sport Ontwikkeling
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NORTH WEST PROVINCE

GRADE 10

MATHEMATICS PAPER2

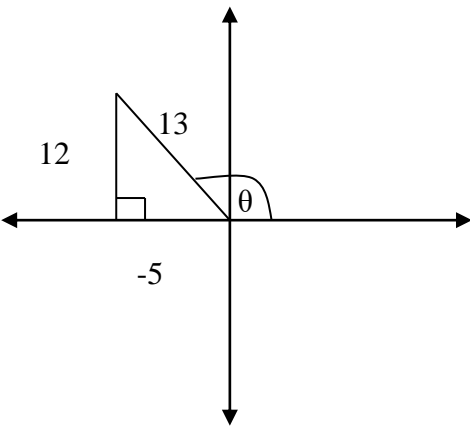**MID – YEAR EXAMINATION 2018**

MEMORANDUM

MARKS: 75

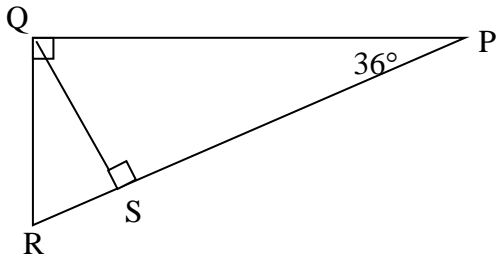**This memorandum consists of 7 pages**

QUESTION 1

1.1	$\sin\theta + \sec\alpha$ $= \sin 47{,}5° + \sec 50{,}3°$ $= \sin 47{,}5° + \dfrac{1}{\cos 50{,}3°}$ $=\ 2.30$ **ANSWER ONLY:** Full marks	✓ substitution ✓ $\dfrac{1}{\cos 50{,}3°}$ ✓ answer (3)
1.2.1	$2\sin x = 2$ $\sin x = 1$ $x = 90°$	✓ division by 2 ✓ answer (2)
1.2.2	$\cos(x - 11°) + 1 = 1{,}79°$ $\cos(x - 11°) = 0{,}79°$ $x - 11° = 37{,}8144°$ $x = 48{,}81°$	✓ transposing ✓ simplification ✓ answer (3)
1.3.1	$\sqrt{24 + \tan^2 45°}$ $= \sqrt{24 + 1}$ $= 5$	✓ 1 ✓ answer (2)
1.3.2	$\dfrac{\sin 60°.\sec 60°.\cot 30°}{\sin 45°}$ $\dfrac{\dfrac{\sqrt{3}}{2}.\,2.\,\sqrt{3}}{\dfrac{\sqrt{2}}{2}}$ $\dfrac{6}{\sqrt{3}}$	✓ $\dfrac{\sqrt{3}}{2}$ ✓ 2 ✓ $\sqrt{3}$ ✓ $\dfrac{1}{\sqrt{2}}$ or $\dfrac{\sqrt{2}}{2}$ ✓ answer (5) **[15]**

QUESTION 2

2.1	$\cos\theta - \sin\theta$ $= \dfrac{-5}{13} - \dfrac{12}{13}$ $= -\dfrac{17}{13}$	✓ correct quad ✓ $r = 13$ ✓ $\dfrac{-5}{13}$ ✓ $\dfrac{12}{13}$ ✓ answer (5)

2.2		
2.2.1	$\cos 36^o = \dfrac{PS}{PQ}$ $\cos 36^o = \dfrac{PQ}{PR}$	✓ answer ✓ answer (2)
2.2.2	$\tan 36^o = \dfrac{QS}{PS}$ $\tan 36^o = \dfrac{QS}{9.5}$ $QS = 9,5\tan 36^o$ $QS = 6,9cm$	✓ ratio ✓ subs of 9,5 ✓ simplification ✓ answer (4)
2.2.3	$\sin 54^o = \dfrac{SP}{QP}$	✓ answer (1) **[12]**

QUESTION 3

3.1	$\sin \beta = \dfrac{opp}{hyp}$ $\sin \beta = \dfrac{122}{1200}$ $\beta = 6^o$ **Answer only: full marks**	✓ ratio ✓ Substitution ✓ Answer (3)

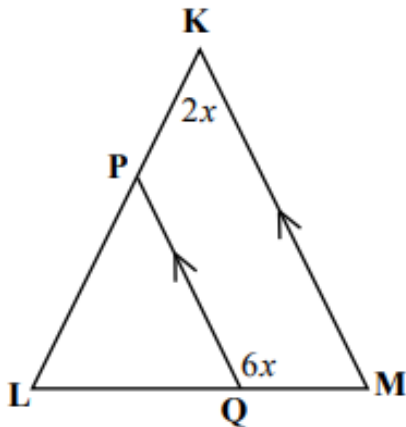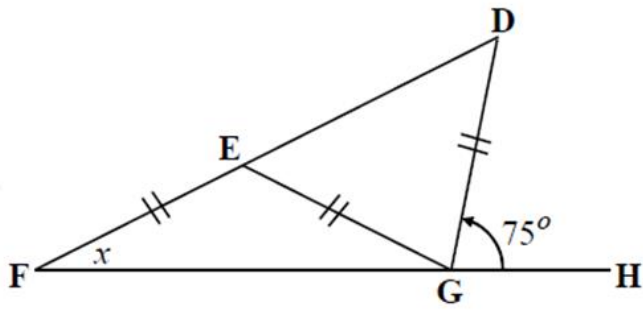|		
3.2.1	$\cos 15^o = \dfrac{QT}{72}$ $QT = 72\cos15^o$ $QT = 69,55 cm$	✓ substitution into the correct ratio ✓ simplification ✓ answer (3)
3.2.2	$\cos35^o = \dfrac{QT}{TR}$ $TR = \dfrac{69,55}{\cos35^o}$ $TR = 84,90 cm$	✓ substitution into the correct ratio ✓ simplification ✓ answer (3) **[9]**

QUESTION 4

4.1		*f* ✔ y – intercept ✔ x – intercept ✔ shape *g* ✔ y – intercept ✔ x – intercept ✔ shape 6
4.2	$0^0 \le x \le 360^0$	✔ notation ✔ end points 2
4.3	$y \in \left[0; 2\right]$ **OR** $0 \le y \le 2$	✔ notation ✔ end points 2 **[10]**

QUESTION 5

5.1	$\hat{L} = \hat{M}$ ($\angle$s opp = sides) $\hat{L} + \hat{M} + 2x = 180^0$ ($\sum$ of $\angle$s of a Δ) $2M + 2x = 180^0$ $\hat{M} = 90^0 - x$ $6x + 90^0 - x = 180^0$ ($co - \text{int } \angle s \ PQ \| KM$) $5x = 90^0$ $x = 18^0$	✓ R ✓ S ✓ R ✓ value of $\hat{M}$ ✓ S ✓ R ✓ answer (7)

5.2		
5.2.1	$E\hat{G}F = x$ ($\angle$s opp = sides/EF = EG)	✓ S ✓ R (2)
5.2.2	$G\hat{E}D = G\hat{D}E = 2x$ (Ext $\angle$ of a Δ $F\hat{E}G$) $\hat{F} + \hat{D} = D\hat{G}H$ (Ext $\angle$ of a $\Delta D\hat{G}F$) $x + 2x = 75^o$ ✓ $x = 25^o$	✓ value of $F\hat{E}G$ ✓ S ✓ R ✓ substitution ✓ answer (5) **[14]**

QUESTION 6

6.1		
6.1.1	$\Delta DOC \ \ and \ \ \Delta BOA$ $OC = OA$ (given) $D\hat{C}O = B\hat{X}O$ (alter...$\angle s$) $D\hat{O}C = B\hat{O}A$ (vert....opp) $\therefore \Delta DOC \equiv \Delta BOA$ (AAS) $\therefore AB = DC$	✓ S/R ✓ S ✓ R ✓ S/R ✓S/R ✓ conclusion (6)
6.1.2	OD = OB ($DOC \equiv \Delta BOA$) $\therefore$ Diagonals bisect each other	✓S ✓R (2)
7.2	$PQ^2 = PT^2 + QT^2$ $10^2 = 8^2 + QT^2$ $QT^2 = 100 - 64$ $QT = \sqrt{36}$ $QT = 6$ $TS = 21 - 6$ $TS = 15$ $PS^2 = TS^2 + PT^2$ $PS^2 = 15^2 + 8^2$ $PS = \sqrt{289}$ $PS = 17$ $\therefore Perimeter = 2(10) + 2(17)$ $= 54cm$	✓ Pythagoras ✓ substitution ✓ $QT = 6$ ✓ $TS = 15$ ✓ $PS = 17$ ✓substitution ✓ answer (7) **[15]**