



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 10

TECHNICAL MATHEMATICS P2

**JUNE 2019
MEMORANDUM**

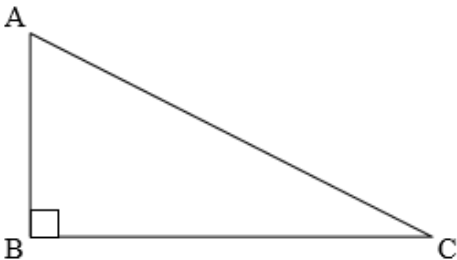
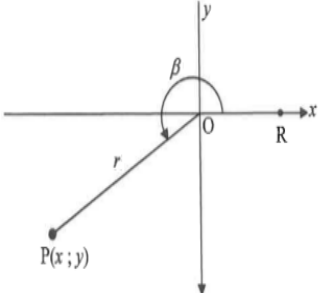
MARKS: 75

This memorandum consists of 7 pages.



NOTE:

- If the learner answered the question TWICE, mark the FIRST attempt ONLY.
- If the learner crossed out an attempt of a question and did not REDO the question, mark the crossed out question.
- Consistent Accuracy (CA) applies in all aspects of memorandum

QUESTION 1		
1.1		
1.1.1	$\sin C = \frac{AB}{AC}$	✓ AC (1)
1.1.2	$\cot A = \frac{AB}{BC}$	✓ cot A (1)
1.2.1	$\sin x + 2 \cos 3y$ $= \sin 38^\circ + 2 \cos 72^\circ$ $= 1,23$	✓ Substitution ✓ Answer (2)
1.2.2	$3 \tan^2(x + y)$ $= 3 \tan^2(38^\circ + 72^\circ)$ $= 22,65$	✓ Substitution ✓ Answer (2)
1.3		
1.3.1	$x = -15$ $r = 17$ $x^2 + y^2 = r^2$ $(-15)^2 + y^2 = (17)^2$ $225 + y^2 = 289$ $y^2 = 64$ $\therefore y = -8$	✓ $x = -15$ ✓ $r = 17$ ✓ Substitution into Pythagoras ✓ Simplification ✓ $y = -8$ (5)

1.3.2 (a)	$\sin \beta = \frac{-8}{17}$	✓ $\frac{-8}{17}$ (1)
1.3.2 (b)	$\cos^2 \beta + \sin^2 \beta$ $= \left(-\frac{15}{17}\right)^2 + \left(-\frac{8}{17}\right)^2$ $= \frac{225}{289} + \frac{64}{289}$ $= \frac{289}{289}$ $= 1$	✓ Substitution ✓ Simplification ✓ Answer (3)
		[15]

QUESTION 2

2.1	$a = 2$	✓ $a = 2$ (1)
2.2	360°	✓ 360° (1)
2.3	$0 \leq y \leq 2$ OR $y \in [0; 2]$	✓ End points ✓ Notation (2)
2.4	$0^\circ < x < 180^\circ$	✓ End points ✓ Notation (2)
2.5	$h(x) = -(\cos x + 1) + 2$ $= -\cos x - 1 + 2$ $= -\cos x + 1$	✓ Multiplying by negative ✓ +2 Answer only (Full marks) (2)
		[8]

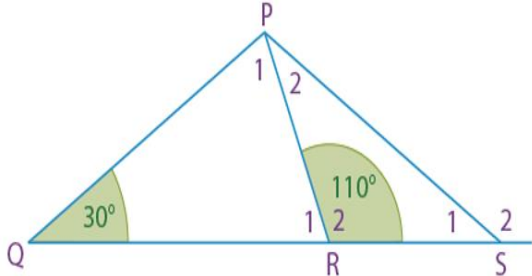
QUESTION 3

3.1		
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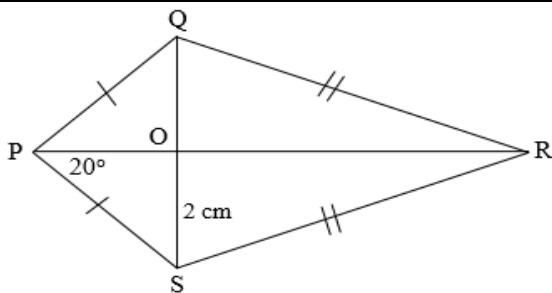
3.1.1	$\tan A = \frac{155}{475}$ $\hat{A} = 18,07232215$ $= 18^\circ$	✓ correct ratio ✓ $\hat{A} = 18,07232215$ ✓ Rounding (3)
3.1.2	EF=155 opp sides of a rectangle $\sin \hat{CBE} = \frac{CE}{BC}$ $\sin 22^\circ = \frac{CE}{800}$ $CE = 800 \sin 22^\circ$ $= 299,69$ $\therefore CF = 299,69 + 155$ $= 454,69$ OR $\cos 68^\circ = \frac{CE}{800}$ $CE = 800 \cos 68^\circ$ $= 299,69$ $\therefore 299,69 + 155$ $= 454,69$	✓ Substitution into the correct ratio ✓ $CE = 299,69$ ✓ $CF = 299,69 + 155$ ✓ Answer (4)
3.2	$\sin^2 45^\circ - \cos 60^\circ + \tan 10^\circ \cdot \cot 10^\circ$ $= \left(\frac{1}{\sqrt{2}}\right)^2 - \frac{1}{2} + \tan 10^\circ \cdot \frac{1}{\tan 10^\circ}$ $= 0 + 1$ $= 1$ OR $\left(\frac{1}{\sqrt{2}}\right)^2 - \frac{1}{2} + \frac{1}{\cot 10^\circ} \cdot \cot 10^\circ$ $= 0 + 1$ $= 1$	✓ $\left(\frac{1}{\sqrt{2}}\right)^2$ ✓ $\frac{1}{2}$ ✓ $\frac{1}{\tan 10^\circ}$ OR $\cot 10^\circ$ ✓ Simplification ✓ Answer (5)
3.3.1	$\cos x = 0,82$ $x = 34,9^\circ$	✓ $x = 34,9^\circ$ (1)
3.3.2	$2 \sin 2x = 0,631$ $\sin 2x = \frac{0,631}{2}$ $2x = 18,39100097$ $x = 9,2^\circ$	✓ dividing by 2 ✓ 18,39100097 ✓ Answer (3)

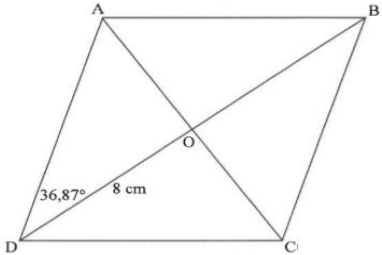
3.3.3	$\tan(x + 20^\circ) = \sin 49,5$ $\tan(x + 20^\circ) = 0,760$ $x + 20^\circ = 37,23483398$ $x = 17,2^\circ$	$\checkmark 0,760$ $\checkmark 37,23483398$ $\checkmark x = 17,2^\circ$
		(3)
		[19]

QUESTION 4

4.1	The sum of two interior opposite angles	$\checkmark\checkmark$ Answer
		(2)
4.2		
4.2.1	$\hat{R}_2 - Q = \hat{P}_1 \dots$ An ext. angle of a triangle $110^\circ - 30^\circ = P_1$ $\therefore \hat{P}_1 = 80^\circ$	\checkmark Statement and reason $\checkmark \hat{P}_1 = 80^\circ$
		(2)
4.2.2	Let $\hat{P}_2 = x = \hat{S}_1 \dots PR = RS$ $\hat{R}_2 + 2x = 180^\circ \dots$ angles of a Δ $2x = 180^\circ - 110^\circ$ $2x = 70^\circ$ $x = 35^\circ = \hat{P}_2$	$\checkmark \hat{R}_2 + 2x = 180^\circ$ and the reason \checkmark simplification $\checkmark \hat{P}_2 = 35^\circ$
		(3)
4.2.3	ΔPRS is isosceles $\Delta \dots PR = RS$	\checkmark Statement \checkmark Reason
		(2)
		[9]

QUESTION 5

5.1.1	Obtuse triangle	\checkmark Answer
		(1)
5.1.2	Right angled triangle	\checkmark Answer
		(1)
5.2.1		
5.2.1	$OQ = 2\text{cm} \dots$ diagonals bisect each other	$\checkmark 2\text{cm}$ \checkmark Reason
		(2)
5.2.2	$\angle POQ = 90^\circ \dots$ diagonals intersect each other at right angles	$\checkmark 90^\circ$ \checkmark Reason
		(2)
5.2.3	$\angle QPO = 20^\circ \dots$ diagonals of a kite bisect angles $\therefore \angle QPS = 20^\circ + 20^\circ = 40^\circ$	$\checkmark \angle QPO = 20^\circ$ with correct reason $\checkmark \angle QPS = 40^\circ$
		(2)

5.3.1		
5.3.1 (a)	$\hat{CDO} = 36,87^\circ \dots$ Diagonals of a rhombus bisect angles.	✓ $\hat{CDO} = 36,87^\circ$ ✓ Reason (2)
5.3.1 (b)	$\hat{AOD} = 90^\circ \dots$ Diagonals of a rhombus bisect each other at right angles	✓ $\hat{AOD} = 90^\circ$ ✓ Reason (2)
5.3.2	$\tan 36,87^\circ = \frac{AO}{8} \dots \Delta AOD$ is a right angled Δ $AO = 8 \times \tan 36,87^\circ$ $= 6cm$	✓ Correct ratio ✓ Answer (2)
5.3.3	$AD^2 = 8^2 + 6^2 \dots$ Pythagoras $= 100$ $\therefore AD = 10cm$ $AE = EB$ converse of midpoint theorem $OE = 5cm$	✓ $AD^2 = 8^2 + 6^2$ with reason ✓ 10 cm ✓ $AE = EB$ ✓ 5 cm (4)
		[18]

QUESTION 6		
6.1	<p>In $\Delta^s NPO$ & YZO</p> <p>$\hat{N} = \hat{Y} = 90^\circ$....given</p> <p>$\hat{NOP} = \hat{YOZ}$...Vert opp angles</p> <p>$\hat{P} = \hat{Z}$.....third angles of a Δ</p> <p>$\Delta NPO \parallel \Delta YZO$</p>	<p>✓ Statement and reason</p> <p>✓ Statement and reason</p> <p>✓ Statement and reason</p> <p>(3)</p>
6.2	<p>$\frac{NP}{YZ} = \frac{NO}{YO}$....Proportional sides</p> <p>$\frac{23}{92} = \frac{x}{124}$</p> <p>$92x = 2852$</p> <p>$\frac{92x}{92} = \frac{2852}{92}$</p> <p>$\therefore x = 31\text{cm}$</p>	<p>✓ $\frac{NP}{YZ} = \frac{NO}{YO}$</p> <p>✓ Substitution</p> <p>✓ $\frac{92x}{92} = \frac{2852}{92}$</p> <p>(3)</p>
		[6]