



education

**MPUMALANGA PROVINCE
REPUBLIC OF SOUTH AFRICA**

NATIONAL SENIOR CERTIFICATE

MATHEMATICS

TERM 1

MARCH 2025

MEMO

MARKS: 58

TIME: 70 minutes

This marking guidelines consists of 6 pages.

Please turn over



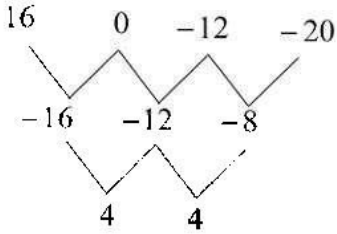
QUESTION 1

1.1.1.	$8; 15; 22; \dots$ $a = 8; d = 7; n = 36$ $T_n = a + (n - 1)d$ $T_{36} = 8 + (36 - 1)(7)$ $T_{36} = 253$	✓substitution ✓answer (2)
1.1.2.	$a = 8; d = 7; n = 36$ $S_{36} = \frac{36}{2}[2(8) + (36 - 1)(7)]$ $S_{36} = 4698$	✓substitution ✓answer (2)
1.1.3.	$T_n = a + (n - 1)d$ $T_{72} = 8 + (72 - 1)(7) = 505$ $T_{72-m} = 8 + (72 - m - 1)(7)$ $T_{-2} + T_{72-m} = 786$ $505 + 8 + 497 - 7m = 786$ $-7m = -224$ $m = 32$	✓value of T_{72} ✓substitution in T_{72-m} ✓value of m (3)
1.2.1	$r = x - 2$	✓answer (1)
1.2.2.	$-1 < x - 2 < 1$ $1 < x < 3$	✓substitution ✓answer (2)
		[10]

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QUESTION 2

2.1.1	 $2a = 4 \quad -16 = 3(2) + b \quad 16 = 2 - 22 + c$ $a = 2 \quad b = -22 \quad c = 36$ $T_n = 2n^2 - 22n + 36$	✓ value of a ✓ value of b ✓ value of c ✓ answer (4)
2.1.2	32; 28; 24; 20; $a = 32$ $d = -4$ $T_n = a + (n-1)d$ $T_n = 32 + (n-1)(-4)$ $T_n = -4n + 36$	✓ substitution ✓ answer (2)
2.1.3	$2n^2 - 22n + 36 = -4n + 36$ $2n^2 - 18n = 0$ $n^2 - 9 = 0$ $n(n-9) =$ $n = 0 \text{ or } n = 9$ $\therefore T_{17} \text{ and } T_{18} \text{ are the terms}$	✓ equating ✓ factors ✓ $n = 9$ ✓ answer (4)
2.2	$T_1 = -54, T_2 = 162, T_3 = -486$ $a = 52, r = -3, n = 7$ $S_7 = \frac{-54((-3)^7 - 1)}{-3 - 1}$ $= -29538$	✓ series ✓ substitution ✓ $n = 7$ ✓ answer (4)
		[14]

QUESTION 3

3.1.1	$(1; -9)$	✓ $x = 1$ ✓ $y = -9$ (2)
3.1.2	$x = 1$	✓ answer (1)
3.1.3	$y \in [-9; \infty)$	✓ answer (1)
3.1.4	$(0; -8)$	✓✓ answer (2)
3.2.1	The graph shifted 9 units upwards and then shifted 1 unit to the left	✓ 9 units upwards ✓ 1 unit to the left (2)
3.2.2	$x \geq 0$ or $x \leq 0$	✓ answer (1)
3.2.3	$x = y^2$ $y = \pm\sqrt{x}, x \geq 0$	✓ interchange x and y ✓ equation ✓ restriction (3)
		[12]

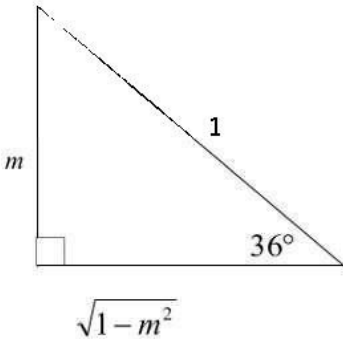
QUESTION 4

4.1	$\frac{27}{8} = a^3$ $\sqrt[3]{\frac{27}{8}} = a$ $\frac{3}{2} = a$	✓ substitution ✓ cube root (2)
4.2		h : ✓ shape ✓ any point ✓ x-intercept (3)
4.3	$x = \left(\frac{3}{2}\right)^y$	✓ swapping x and y ✓ answer (2)

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	$g(x) = \log_{\frac{3}{2}} x$	
4.4	$x \in \left(0 : 3\frac{3}{8}\right)$	✓ answer (1)
		[8]

QUESTION 5

5.1	 $\cos 36^\circ = \sqrt{1 - m^2}$ OR $\cos^2 36^\circ + \sin^2 36^\circ = 1$ $\cos^2 36^\circ = 1 - \sin^2 36^\circ$ $ = 1 - m^2$ $\cos 36^\circ = \sqrt{1 - m^2}$	✓ correct diagram ✓ $x = \sqrt{1 - m^2}$ ✓ answer (3)
5.2	$\frac{-2 \sin 15^\circ \cdot \cos 15^\circ}{\cos(45^\circ - x) \cos x - \sin(45^\circ - x) \sin x}$ $= \frac{-\sin 30^\circ}{[\cos x \cos 45^\circ + \sin x \cos 45^\circ] \cos x - [\sin 45^\circ \cos x - \sin x \cos 45^\circ] \sin x}$ $= \frac{-\frac{1}{2}}{\left[\cos x \cdot \frac{1}{\sqrt{2}} + \sin x \cdot \frac{1}{\sqrt{2}}\right] \cos x - \left[\frac{1}{\sqrt{2}} \cos x - \sin x \cdot \frac{1}{\sqrt{2}}\right] \sin x}$ $= \frac{-\frac{1}{2}}{\frac{1}{\sqrt{2}} \cos^2 x + \frac{1}{\sqrt{2}} \sin x \cdot \cos x - \frac{1}{\sqrt{2}} \sin x \cdot \cos x + \frac{1}{\sqrt{2}} \sin^2 x}$	✓ $-\sin 30^\circ$ ✓ compound angle ✓ compound angle $\frac{1}{2}$ ✓ $\cos 45^\circ = \sin 45^\circ = \frac{1}{\sqrt{2}}$ ✓ common factor (6)

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	$= \frac{-\frac{1}{2}}{-\frac{1}{\sqrt{2}} \cos^2 x + \frac{1}{\sqrt{2}} \sin^2 x}$ $= \frac{-\frac{1}{2}}{\frac{1}{\sqrt{2}} (\cos^2 x + \sin^2 x)}$ $= \frac{-\sqrt{2}}{2}$ OR $= \frac{-\sin 30^\circ}{\cos[(45^\circ - x) + x]}$ $= \frac{-\frac{1}{2}}{\cos 45^\circ}$ $= \frac{-\frac{1}{2}}{\frac{1}{\sqrt{2}}}$ $= \frac{-\sqrt{2}}{2}$	✓ $-\sin 30^\circ$ ✓✓ compound angle ✓ $-\frac{1}{2}$ ✓ $\cos 45^\circ$ ✓ $\frac{1}{\sqrt{2}}$ (6)
5.3.1	$AC^2 = (12)^2 + (20)^2 - 2(12)(20) \cos 110^\circ$ $AC^2 = 708,17$ $\therefore AC = 26,61$	✓ substitution ✓ answer (2)
5.3.2	$\frac{\sin \hat{DAC}}{DC} = \frac{\sin \hat{ADC}}{AC}$ $\frac{\sin \hat{DAC}}{7} = \frac{\sin 71^\circ}{26,61}$ $\sin \hat{DAC} = 0,2487$ $\hat{DAC} = 14,4^\circ$	✓ correct ratio ✓ substitution ✓ answer (3)
		[14]

TOTAL MARKS: 58

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