LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION

SEKHUKHUNE SOUTH DISTRICT

MATHEMATICS

GRADE 11

TEST 4

OCT 2023

MARKING GUIDELINES

MARKS: 50

This memorandum consists of 4 pages including the cover page

	QUESTION 1		
1.1			
	1.1.1	-12 ✓	✓answer (1)
	1.1.2	$T_n = 3 + (n-1)(-5)$ ✓ $= 8 - 5n$ ✓	✓ Substitution ✓ Answer (2)
	1.1.3	$T_{21} = 8 - 5(21)$ ✓ $= -97$✓	✓ Substitution ✓ Answer (2)
	1.1.4	$-162 = 8 - 5n$ ✓ $\therefore\ n = 34$✓	✓equating ✓answer (2)
1.2	$3x + 1 - 4 = 4x + 2 - (3x + 1)$ ✓ $3x - 3 = x + 1$ $2x = 4$ ✓ $x = 2$ ✓		✓ Equating ✓simplification ✓ Answer (3)
1.3			
	1.3.1	*1 ; x ; 19 ; y ; 34* $x - 1$ ✓ $\quad 19 - x \quad y - 19 \quad 34 - y$ $-2x + 20 \quad y + x - 38 \quad 53 - 2y$ $-2x + 20 = 4$ $2x = 16$ $x = 8$ ✓ $y + x - 38 = 4$ $y + 8 - 38 = 4$ $y = 34$ ✓	✓ 1st difference ✓ 2nd difference ✓ $x = 8$ ✓$y = 34$ (4)
	1.3.2	$2a = 4$ $a = 2$ ✓ $3a + b = 7$ $b = 1$ ✓ $a + b + c = 1$ $2+1 + c = 1$ $c = -2$✓ $\therefore T_n = 2n^2 + n - 2$ ✓	✓ $a = 2$ ✓$b = 1$ ✓$c = -2$ ✓ answer (4)
	1.3.3	$2n^2 + n - 2 = 463$✓ $2n^2 + n - 465 = 0$✓ $(2n + 31)(n - 15) = 0$✓ $n = 15$ *or* $n \neq -\frac{31}{2}$ ✓	✓ equating ✓standard form ✓ factors ✓answer/rejecting $n = -\frac{31}{2}$ (4)

	1.3.4	*The second difference is linear* *7 ; 11 ; 15* *4 4* ✓ $T_n = 7 + (n-1)4$ $T_n = 4n + 3$ $203 = 4n + 3$ $n = 50$ ✓ *∴203 will lie between* T_{50} *and* T_{51} ✓	✓ common difference ✓ $n = 50$ ✓ Answer (3)
	1.3.5	$T_n = 2n^2 + n - 2$ $= 2(n^2 + \frac{1}{2}n - 1)$ $= 2\left(n + \frac{1}{4}\right)^2$ ✓ $-\frac{5}{2}$ *∴Since* $2\left(n + \frac{1}{4}\right)^2 > -\frac{5}{2}$ ✓ *All the terms of the quadratic pattern are positive* ✓ ✓	✓ $2\left(n + \frac{1}{4}\right)^2$ ✓ $-\frac{5}{2}$ ✓✓ answer (4)
			[29]
	QUESTION 2		
2.1			
	2.1.1	$V_{roof} = \frac{1}{3}\pi r^2 H$ $V_{roof} = \frac{1}{3}\pi(6,3)^2(0,06)$ ✓ ✓ $= 0.7938m^3$ ✓	✓converting 60cm ✓substitution ✓ answer (3)
	2.1.2	$V_{house} = l \times b \times h$ $V = (6,3) \times (6,3) \times (2,5)$ ✓ $V = 99,225\ m^3$ ✓ *Total volume* $= 99,225 + 0,7938$ ✓ $= 100,02m^3$ ✓	✓substitution ✓ 99,225 m^3 ✓ adding the volumes ✓answer **C.A applies from 2.1.1** (4)
	2.1.3	$TSA = lb + 2lh + 2bh$ ✓ $= (6,3)(6,3) + 2(6,3)(2,5) + 2(6,3)(2,5)$ ✓ $= 86,94\ m^2$ ✓	✓correct formula ✓ substitution ✓answer (3)

2.2	2.2.1	$V = \pi r^2 h$ $r = \sqrt{\frac{V}{\pi h}}$✓ $= \sqrt{\frac{5000}{\pi(15)}}$✓ $= 10{,}30\ cm$✓	✓manipulation ✓ substitution ✓ answer (3)
	2.2.2	$H^2 + r^2 = s^2$✓ $H = \sqrt{s^2 - r^2}$ $= \sqrt{(13)^2 - (0.30)^2}$ $= 7{,}93\ cm$ ✓	✓ Pythagoras ✓7,93 cm (2)
	2.2.3	$V_{cone} = \frac{1}{3}\pi r^2 H$ $= \frac{1}{3}\pi(10{,}30)^2(7{,}93)$ ✓ $= 881cm^3$✓	✓ substitution ✓ answer **C.A applies from 2.2.1 if $r > 0$** (2)
	2.2.4	$TSA = Area_{cylinder} + Area_{cone}$ $= \pi r^2 + 2\pi rh + \pi rs$✓ $= \pi(10{,}3)^2 + 2\pi(10{,}3)(15)$✓ $+ \pi(10{,}3)(13)$ ✓ $= 1304{,}0436 \ldots + 420{,}6592 \ldots$ $= 1724.70\ cm^2$✓	✓ correct formula for area of container ✓ $\text{Area}_{\text{cylinder}}$ ✓$\text{Area}_{\text{cone}}$ ✓ answer (4)
			[21]
		TOTAL : 50 MARKS	