Ex2.2

(38) Sequence 1:

n	Sn		
1	6	>6	>2
2	12	>8	>2
3	20	>10	
4	30		

Sequence 2:

n	Rn	
1	126	>-2
2	124	>-2
3	122	>-2
4	120	

Understanding the problem:

- Both sequences have a pattern so first I will try and find a pattern based on the part of the sequence I know.

Devising a plan:

- when I find a pattern, I will be able to determine the value in which the two graphs will intersect.

✓

Carrying out the plan:

Sequence 1 had a second difference of 2. which is a finite difference. ✓

$Sn = (n+1)^2 + (n+1)$ the algebraic rule for Sequence 1 is $\boxed{Sn = (n+1)^2 + (n+1).}$

✓

n = 1	n = 2	n = 3
$Sn = (1+1)^2 + (1+1)$	$Sn = (2+1)^2 + (2+1)$	$Sn = (3+1)^2 + (3+1)$
$Sn = 2^2 + 2$	$Sn = 3^2 + 3$	$Sn = 4^2 + 4$
$Sn = 4 + 2$	$Sn = 9 + 3$	$Sn = 16 + 4$
$S(1) = 6$	$S(2) = 12$	$S(3) = 20$

sequence 2 has a pattern of minus 2. the pattern is decreasing.

$\boxed{R_n = -2n + 128}$ the difference between the sequence is 2, which is how you get $-2n$, and the y-intercept is 128.

✓

n = 1	n = 2	n = 3
$s_n = -2n + 128$	$s_n = -2n + 128$	$s_n = -2n + 128$
$s_n = -2(1) + 128$	$s_n = -2(2) + 128$	$s_n = -2(3) + 128$
$s_{(1)} = 126$	$s_{(2)} = 124$	$s_{(3)} = 122$

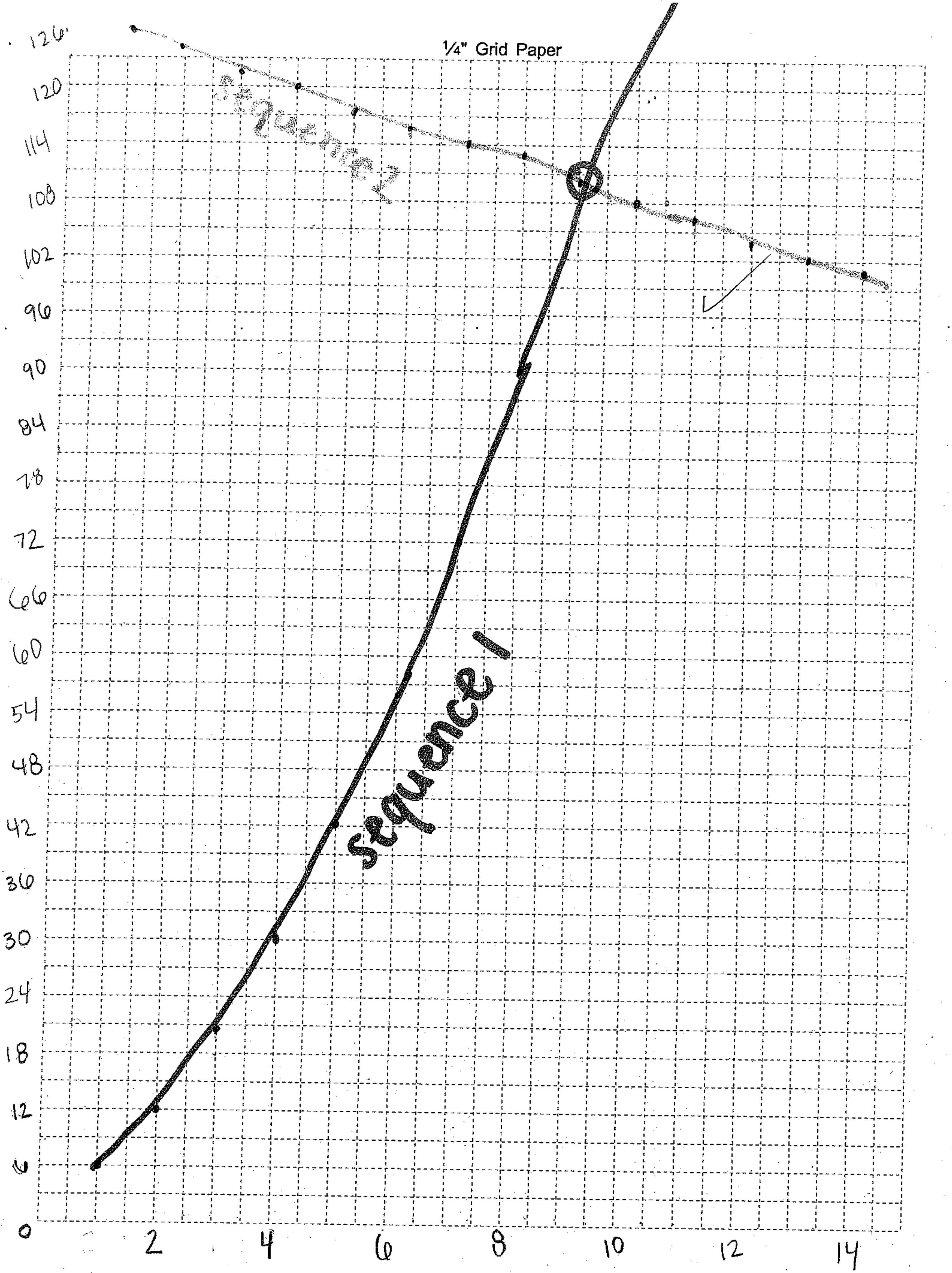
Looking Back

a) the algebraic rule for sequence 1 = $(n+1)^2 + (n+1)$
the algebraic rule for sequence 2 = $-2n + 128$

b) the graph is on separate sheet

c) the graph intersects at the 9th figure

d) the 9th figure in both sequences have 110 tiles. For $n < 9$, the n^{th} figure in sequence 1 has less tiles than the nth figure in sequence 2. For $n > 9$, the nth figure in sequence 1 has more tiles than the nth figure in sequence 2.



¼" Grid Paper
sequence 2
sequence 1
126
120
114
108
102
96
90
84
78
72
66
60
54
48
42
36
30
24
18
12
6
0
2
4
6
8
10
12
14