

Name Key Date _____ Hour _____ Score _____

Linear Equations from Tables and Patterns

Write the recursive and explicit formulas for each arithmetic sequence. Use your equation to complete the table.

1)

1	6
2	7
3	8
...	...
10	15
100	105
150	155

R: $a_n = a_{n-1} + 1, a_1 = 6$
 E: $a(n) = 6 + (n-1)(1)$

2)

1	7
2	11
3	15
...	...
10	43
100	403
150	603

R: $a_n = a_{n-1} + 4, a_1 = 7$
 E: $A(n) = 7 + (n-1)(4)$

3)

2	7
3	11
4	15
...	...
10	39
100	399
150	599

R: $a_n = a_{n-1} + 4, a_2 = 7$
 E: $A(n) = 3 + (n-1)(4)$

4)

2	1
4	3
6	5
...	...
10	9
100	99
150	149

R: $a_n = a_{n-2} + 2, a_2 = 1$
 E: $A(n) = 0 + (n-1)(1)$

5)

1	3
2	6
3	9
...	...
10	30
100	300
150	450

R: $a_n = a_{n-1} + 3, a_1 = 3$
 E: $A(n) = 3 + (n-1)(3)$

6)

1	8
2	13
3	18
...	...
10	53
100	503
150	753

R: $a_n = a_{n-1} + 5, a_1 = 8$
 E: $A(n) = 8 + (n-1)(5)$

7)

3	11
4	16
5	21
...	...
10	46
100	496
150	746

R: $a_n = a_{n-1} + 5, a_3 = 11$
 E: $A(n) = 1 + (n-1)(5)$

8)

1	8
2	12
3	16
...	...
10	44
100	404
150	604

R: $a_n = a_{n-1} + 4, a_1 = 8$
 E: $A(n) = 8 + (n-1)(4)$

9)

1	8
2	10
3	12
...	...
10	26
100	206
150	306

R: $a_n = a_{n-1} + 2, a_1 = 8$
 E: $A(n) = 8 + (n-1)(2)$

10)

1	1
2	3
3	5
4	7
...	...
10	19
100	199
150	299

R: $a_n = a_{n-1} + 2, a_2 = 3$
 E: $A(n) = 1 + (n-1)(2)$

11)

4	3
6	4
8	5
...	...
10	6
100	51
150	76

R: $a_n = a_{n-2} + 1, a_4 = 3$
 E: $A(n) = 1.5 + (n-1)(.5)$

12)

2	25
4	29
6	33
...	...
10	41
100	221
150	321

R: $a_n = a_{n-2} + 4, a_2 = 25$
 E: $A(n) = 23 + (n-1)(2)$

Write the recursive and explicit formulas for each arithmetic sequence.

y represents the number of boxes at each step "x"

13. $x=1$ $x=2$ $x=3$ $x=4$

 $R: a_n = a_{n-1} + 3, a_1 = 1$ $E: A(n) = 1 + (n-1)(3)$

14. $x=0$ $x=1$ $x=2$ $x=3$

 $R: a_n = a_{n-1} + 2, a_0 = 3$ $E: A(n) = 5 + (n-1)(2)$

15. $x=2$ $x=4$ $x=6$ $x=8$

 $R: a_n = a_{n-2} + 1, a_2 = 3$ $E: A(n) = 2.5 + (n-1)(0.5)$

16. $x=2$ $x=4$ $x=6$ $x=8$

 $R: a_n = a_{n-2} - 1, a_2 = 5$ $E: A(n) = 5.5 + (n-1)(-0.5)$

y represents the number of ducks in each row "x"

17. $x=0$ $x=1$ $x=2$ $x=3$ $x=2$ $x=4$ $x=6$ $x=8$

 $R: a_n = a_{n-1} - 1, a_0 = 5$ $E: A(n) = 4 + (n-1)(-1)$ $R: a_n = a_{n-2} + 2, a_2 = 2$ $E: A(n) = 1 + (n-1)(2)$

19. $x=2$ $x=4$ $x=6$ $x=8$ $x=2$ $x=4$ $x=6$ $x=8$

 $R: a_n = a_{n-2} - 1, a_2 = 5$ $E: A(n) = 5.5 + (n-1)(-0.5)$ $R: a_n = a_{n-2} + 0, a_2 = 2$ $E: A(n) = 2 + (n-1)(0)$

y represents the number of dots at each step "x"

21. $x=1$ $x=2$ $x=3$ $x=4$

 $R: a_n = a_{n-1} + 4, a_1 = 4$ $E: A(n) = 4 + (n-1)(4)$

22. $x=0$ $x=1$ $x=2$ $x=3$

 $R: a_n = a_{n-1} + 2, a_0 = 3$ $E: A(n) = 5 + (n-1)(2)$

23. $x=3$ $x=6$ $x=9$ $x=12$

 $R: a_n = a_{n-3} + 4, a_3 = 4$ $E: A(n) = \frac{4}{3} + (n-1)(\frac{4}{3})$

24. $x=1$ $x=2$ $x=3$ $x=4$

 $R: a_n = a_{n-1} - 2, a_1 = 16$ $E: A(n) = 16 + (n-1)(-2)$