

Key

3.3 Practice

For each of the tables, do the following:

- Compute the first and second differences
- Identify the function in which the table is representing
- Write the explicit equation for the table

1.

X	Y	1 <sup>st</sup> difference	2 <sup>nd</sup> difference
0	28	-12	+4
1	16	-8	+4
2	8	-4	+4
3	4	0	+4
4	4	+4	+4
5	8	+8	+4
6	16		

Constant/Linear/quadratic/exponential?

Explicit equation:  $y = 2x^2 - 14x + 28$

$a = 2$   
 $b = -14$   
 $c = 28$

$$8 = 2(2)^2 + 2b + 28$$

$$8 = 8 + 2b + 28$$

$$8 = 36 + 2b$$

$$-36 - 36$$

$$-28 = 2b$$

$$b = -14$$

2.

X	Y	1 <sup>st</sup> difference	2 <sup>nd</sup> difference
0	37	+0	10
1	27	+10	10
2	27	+20	10
3	37	+30	10
4	57	+40	10
5	87		
6	127		

Constant/Linear/quadratic/exponential?

Explicit equation:  $y = 5x^2 - 15x + 37$

$a = 5$   
 $b = -15$   
 $c = 37$

$$27 = 5(2)^2 + 2b + 37$$

$$27 = 20 + 2b + 37$$

$$27 = 57 + 2b$$

$$b = -15$$

3.

X	Y	1 <sup>st</sup> difference	2 <sup>nd</sup> difference
0	36	0	4
1	32	+4	4
2	32	+8	4
3	36	+12	4
4	44	+16	4
5	56		
6	72		

Constant/Linear/quadratic/exponential?

Explicit equation:  $y = 2x^2 - 6x + 36$

$a = 2$   
 $c = 36$   
 $b = -6$

$$32 = 2(2)^2 + 2b + 36$$

$$32 = 8 + 2b + 36$$

$$32 = 44 + 2b$$

$$-12 = 2b$$

$$b = -6$$

4.

X	Y	1 <sup>st</sup> difference	2 <sup>nd</sup> difference
0	-92	+32	
1	-50	+24	
2	-26	+16	-8
3	-10	+8	-8
4	-2	+0	-8
5	-2	-8	-8
6	-10	-16	-8
7	-26		

Constant/Linear/quadratic/exponential?

Explicit equation:  $y = -4x^2 + 36x - 82$

$a = -4$   
 $c = -82$   
 $b = 36$

$-10 = -4(3)^2 + 3b - 82$   
 $-10 = -36 + 3b - 82$   
 $-10 = 3b - 118$   
 $-108 = 3b$      $b = 36$

f(42) = \_\_\_\_\_

5. Create a table to represent the following picture. Then find the first and second difference, and write the explicit equation and solve for when  $x = 43$



1



2



3

4

a.

X	Y	1 <sup>st</sup> difference	2 <sup>nd</sup> difference
0	1	1	
1	2	3	2
2	5	5	2
3	10	7	
4	17		
10	101		
100	10001		

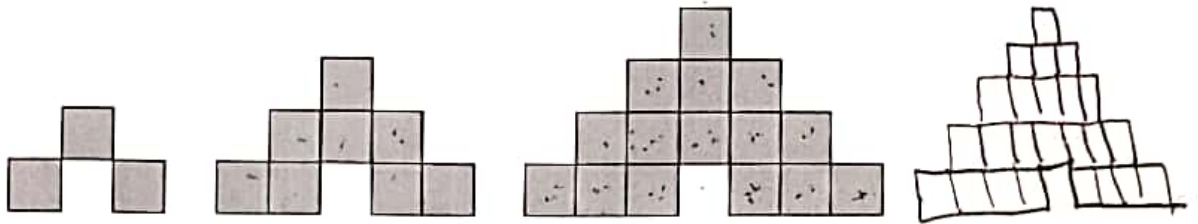
B. Constant/Linear/quadratic/exponential?

Explicit equation:  $y = x^2 + 0x + 1$

$y = x^2 + bx + 1$     or  $y = x^2 + 1$   
 $2 = 1^2 + b + 1$   
 $2 = 2 + b$   
 $b = 0$

d. f(43) = \_\_\_\_\_

6. Create a table to represent the following picture. Then find the first and second difference, and write the explicit equation and solve for when  $x = 43$



b.

x	y	1 <sup>st</sup> difference	2 <sup>nd</sup> difference
0	0	} 3 } +5 } +7 } +9	} 2 } +2 } +2
1	3		
2	8		
3	15		
4	24		
10	120		
100	10,200		

B. Constant/Linear/quadratic/exponential?

c. Explicit equation:  $y = x^2 + 2x$

$$\begin{aligned} 8 &= 2^2 + 2b + 0 \\ 8 &= 4 + 2b \\ b &= 2 \end{aligned}$$

d.  $f(43) =$  \_\_\_\_\_

7. Create a table to represent the following picture. Then find the first and second difference, and write the explicit equation and solve for when  $x = 20$

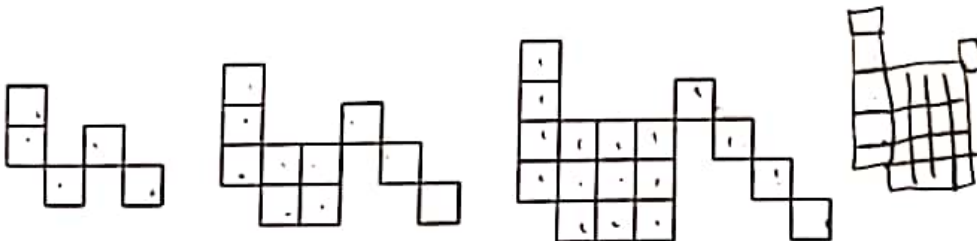


Fig. #	Number of Boxes
0	2
1	5
2	10
3	17
4	26
10	122
100	10,202

Constant/Linear/quadratic/exponential?

Explicit equation:  $y = x^2 + 2x + 2$

$f(43) =$  \_\_\_\_\_

$$\begin{aligned} 10 &= 2^2 + 2b + 2 \\ 10 &= 4 + 2b + 2 \\ 10 &= 6 + 2b \\ b &= 2 \end{aligned}$$