

Linear Quadratic or Exponential? Tables

Linear Functions have a Constant rate of change
(constant first difference)

x	-3	-2	-1	0	1	2	3
y	-7	-5	-3	-1	1	3	5

+2 +2 +2 +2 +2 +2



Exponential Functions have a Constant ratio

x	-3	-2	-1	0	1	2	3
y	1/8	1/4	1/2	1	2	4	8

x2 x2 x2 x2 x2 x2

Quadratic Functions have a Constant second difference

x	-3	-2	-1	0	1	2	3
y	9	4	1	0	1	4	9

-5 -3 -1 1 3 5
→ 2 2 2 2 2

Second difference

Identify each as linear, exponential, or quadratic.

1. LINEAR

x	-3	-2	-1	0	1	2	3
y	14	10	6	2	-2	-6	-10

-4 -4 -4 -4 -4 -4

2. Exponential

x	-3	-2	-1	0	1	2	3
y	1/2	1	2	4	8	16	32

x2 x2 x2 x2 x2 x2

3. QUADRATIC

x	-3	-2	-1	0	1	2	3
y	21	12	5	0	-3	-4	-3

-9 -5 -3 -1 1

4. LINEAR

x	-3	-2	-1	0	1	2	3
y	-16	-13	-10	-7	-4	-1	2

+3 +3 +3 +3 +3 +3

5. LINEAR

x	-3	-2	-1	0	1	2	3
y	-14	-9	-4	1	6	11	16

+5 +5 +5 +5 +5 +5

6.

x	-3	-2	-1	0	1	2	3
y	-18	-6	-2	0	2	6	18

7. Exponential

x	-3	-2	-1	0	1	2	3
y	4	8	16	32	64	128	256

x2 x2 x2 x2 x2 x2

8. Exponential

x	-3	-2	-1	0	1	2	3
y	1/27	1/9	1/3	1	3	9	27

x3 x3 x3 x3 x3 x3

9. Quadratic

x	-3	-2	-1	0	1	2	3
y	30	20	12	6	2	0	0

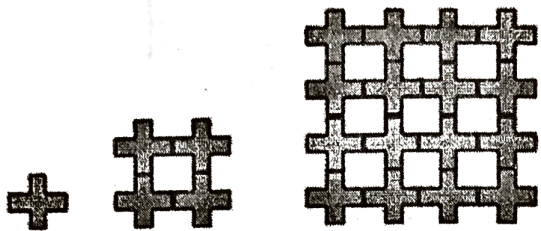
-10 -8 -6 -4 -2 0
+2 +2 +2 +2 +2

10. LINEAR

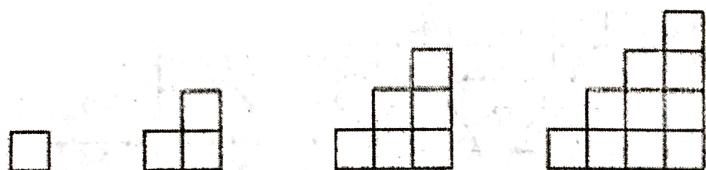
x	-3	-2	-1	0	1	2	3
y	11	9	7	5	3	1	-1

-2 -2 -2 -2 -2 -2

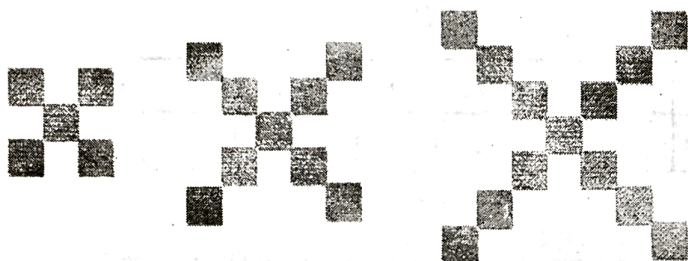
Identify each pattern as linear, quadratic, or exponential growth. Then write the rule for the pattern.



Exponential
 $f(x) = 4^{x-1}$
 $a_n = 1 \cdot 4^{n-1}$



QUADRATIC



LINEAR
 $f(x) = 4x + 1$
 $a_n = 5 + 4(n-1)$