Writing Linear Functions

Determine whether or not the relationship shows a linear function. If the data set represents a linear function, write the equation for the function.

5.

x	y
1	1
2	4
3	9
4	16
5	25

SOLUTION:

Δx = 1; Δy = 3, 5, 7, 9

nonlinear because Δy is not constant

ANSWER:

nonlinear

6.

x	y
1	5.5
2	7.5
3	9.5
4	11.5
5	13.5

SOLUTION:

Δx = 1; Δy = 2

Linear because Δy is constant

m = $\frac{\Delta y}{\Delta x} = \frac{2}{1} = 2$

when x = 0, y = 5.5 – 2 = 3.5

y = 2x + 3.5

ANSWER:

y = 2x + 3.5

7.

x	y
1	8
2	11
3	14
4	17
5	20

SOLUTION:

Δx = 1; Δy = 3

Linear because Δy is constant

m = $\frac{\Delta y}{\Delta x} = \frac{3}{1} = 3$

when x = 0, y = 8 – 3 = 5

y = 3x + 5

ANSWER:

y = 3x + 5

8.

x	y
1	24
2	20
3	16
4	12
5	8

SOLUTION:

Δx = 1; Δy = -4

Linear because Δy is constant

m = $\frac{\Delta y}{\Delta x} = \frac{-4}{1} = -4$

when x = 0, y = 24 + 4 = 28

y = -4x + 28

ANSWER:

y = -4x + 28

9.

x	y
0	1.7
1	1.1
2	0.5
3	−0.1
4	−0.7

SOLUTION:

Δx = 1; Δy = -0.6

Linear because Δy is constant

m = $\frac{\Delta y}{\Delta x} = \frac{-0.6}{1}$ = -0.6

when x = 0, y = 1.7

y = -0.6x + 1.7

ANSWER:

y = -0.6x + 1.7

10.

x	y
0	2
2	4
4	8
6	16
8	32

SOLUTION:

Δx = 2; Δy = 2, 4, 8, 16

nonlinear because Δy is not constant

ANSWER:

nonlinear

11.

x	y
2	4
4	5
6	7
8	10
10	14

SOLUTION:

Δx = 2; Δy = 1, 2, 3, 4

nonlinear because Δy is not constant

ANSWER:

nonlinear

12.

x	y
2	8
4	9
6	10
8	11
10	12

SOLUTION:

Δx = 2; Δy = 1

Linear because Δy is constant

m = $\frac{\Delta y}{\Delta x} = \frac{1}{2}$ = 0.5

when x = 0, y = 8 – 1 = 7

y = 0.5x + 7

ANSWER:

y = 0.5x + 7

13.

x	y
3	2
5	10
7	18
9	26
11	34

SOLUTION:

Δx = 2; Δy = 8

Linear because Δy is constant

m = $\frac{\Delta y}{\Delta x} = \frac{8}{2} = 4$

when x = 0, y = 2 – 12 = -10

y = 4x - 10

ANSWER:

y = 4x - 10

14.

x	y
1	10
2	8
3	6
4	4
5	2

SOLUTION:

Δx = 1; Δy = -2

Linear because Δy is constant

m = $\frac{\Delta y}{\Delta x} = \frac{-2}{1} = -2$

when x = 0, y = 10 + 2 = 12

y = -2x + 12

ANSWER:

y = -2x + 12

15.

x	y
1	16
2	15
3	13
4	10
5	6

SOLUTION:

Δx = 1; Δy = -1, -2, -3

nonlinear because Δy is not constant

ANSWER:

nonlinear

16.

x	y
1	120
2	60
3	40
4	30
5	24

SOLUTION:

Δx = 1; Δy = -60, -20, -10, -6

nonlinear because Δy is not constant

ANSWER:

nonlinear