

Objective 70

Determine whether a table represents a linear or nonlinear function

PROBLEM

Determine which of the tables below represents a linear function.

x	-6	-4	-2	0
y	-12	-32	-4	0

x	-6	-4	-2	0
y	-33	-25	-17	-9

x	-6	-4	-2	0
y	-34	-27	-20	-14

STEP 1

Recall how to determine if a table of values represents a linear function.

In a linear function, the x -values and y -values have a constant rate of change. Determine the rate of change by subtracting consecutive values in the table.

If the rate of change for the x - or y -values is not constant, then the function is nonlinear.

STEP 2

Determine if the first table represents a linear function. Subtract consecutive values to see if there is a constant rate of change.

x	-6	-4	-2	0
y	-12	-32	-4	0

$$\begin{aligned} -4 - (-6) &= 2 && \text{The } x\text{-values have a constant rate of change of 2.} \\ -2 - (-4) &= 2 \\ 0 - (-2) &= 2 \end{aligned}$$

$$\begin{aligned} -32 - (-12) &= -20 && \text{The } y\text{-values do not have a constant rate of change.} \\ -4 - (-32) &= 28 \\ 0 - (-4) &= 4 \end{aligned}$$

This function is nonlinear.

STEP 3

Determine if the second table represents a linear function.

x	-6	-4	-2	0
y	-33	-25	-17	-9

$$\begin{aligned} -4 - (-6) &= 2 && \text{The } x\text{-values have a constant rate of change of 2.} \\ -2 - (-4) &= 2 \\ 0 - (-2) &= 2 \end{aligned}$$

$$\begin{aligned} -25 - (-33) &= 8 && \text{The } y\text{-values have a constant rate of change of 8.} \\ -17 - (-25) &= 8 \\ -9 - (-17) &= 8 \end{aligned}$$

This function is linear.

STEP 4

Determine if the third table represents a linear function.

x	-6	-4	-2	0
y	-34	-27	-20	-14

$$\begin{aligned} -4 - (-6) &= 2 && \text{The } x\text{-values have a constant rate of change of 2.} \\ -2 - (-4) &= 2 \\ 0 - (-2) &= 2 \end{aligned}$$

$$\begin{aligned} -27 - (-34) &= 7 && \text{The } y\text{-values do not have a constant rate of change.} \\ -20 - (-27) &= 7 \\ -14 - (-20) &= 6 \end{aligned}$$

This function is nonlinear.

ANSWER

x	-6	-4	-2	0
y	-33	-25	-17	-9

Guided Practice:

1. One of the tables represents a linear function. Which table is it?

[A]

x	8	10	12	14
y	4	6	8	10

[B]

x	8	10	12	14
y	7	6	5	3

[C]

x	8	10	12	14
y	4	20	6	28

2. One of the tables represents a linear function. Circle it.

x	12	15	18	21
y	5	25	125	625

x	12	15	18	21
y	9	12	16	23

x	12	15	18	21
y	8	10	12	14

Independent Practice:

3. One of the tables represents a linear function. Which table is it?

[A]

x	-8	-6	-4	-2
y	-9	-10	-11	-13

[B]

x	-8	-6	-4	-2
y	-13	-11	-9	-7

[C]

x	-8	-6	-4	-2
y	-4	-12	-2	-4

4. One of the tables represents a linear function. Circle it.

x	-6	-4	-2	0
y	-12	-32	-4	0

x	-6	-4	-2	0
y	-33	-25	-17	-9

x	-6	-4	-2	0
y	-34	-27	-20	-14