LESSON MAKER PRO

Line Story Clues

Read rates and starting values from rules, tables, and graphs.

GRADE 8 · 8.FGR.5.8

8.FGR.5.8 "Explain the meaning of the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values."

NAME _____ DATE _____

TWO IMPORTANT CLUES

The rate of change tells how much y changes when x increases by 1. The initial value is the y-value when x = 0, and it is where the line crosses the y-axis.

WORKED EXAMPLE

For y = 7x + 12, find and explain the rate of change and initial value.

1. The coefficient of x is 7.
2. The constant term is 12.
3. Rate of change = 7.
4. Initial value = 12.

Answer: y increases by 7 for each increase of 1 in x. When x = 0, y = 12.

PRACTICE 5 problems

1 For y = 4x + 9, state the rate of change and initial value.

ANSWER _____

2 A table has x-values 0, 1, 2 and y-values -2, 1, 4. State the rate of change and initial value.

ANSWER _____

3 A line crosses the y-axis at 6 and rises 2 units for each 1 unit it moves right. State the rate of change and initial value.

ANSWER _____

4 For y = -3x + 8, explain what the rate of change means.

ANSWER _____

5 A table has x-values 0, 2, 4 and y-values 5, 11, 17. State the rate of change and initial value.

ANSWER _____

APPLY IT Show your work

1 A music app charges $6 to join, then $2 for each song download. The cost is C = 2x + 6. Explain the rate of change and initial value.

WORK SPACE

ANSWER _____

2 Jalen has $30 in a game account and spends $4 each day. The balance is B = 30 - 4x. Explain the rate of change and initial value.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A function has this table: x-values 0, 3, 6; y-values 14, 20, 26. Explain how the table shows the rate of change and initial value.

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ANSWER KEY

Line Story Clues

GRADE 8 · 8.FGR.5.8

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	For y = 4x + 9, state the rate of change and initial value.	**Rate of change: 4. Initial value: 9.**
2	A table has x-values 0, 1, 2 and y-values -2, 1, 4. State the rate of change and initial value.	**Rate of change: 3. Initial value: -2.**
3	A line crosses the y-axis at 6 and rises 2 units for each 1 unit it moves right. State the rate of change and initial value.	**Rate of change: 2. Initial value: 6.**
4	For y = -3x + 8, explain what the rate of change means.	**y decreases by 3 for each increase of 1 in x. The initial value is 8.**
5	A table has x-values 0, 2, 4 and y-values 5, 11, 17. State the rate of change and initial value.	**Rate of change: 3. Initial value: 5.**

PART 2 · APPLY IT

1. **The cost increases by $2 per song download. The starting cost is $6.** The coefficient of x is 2, so each download adds $2. The constant 6 is the cost when zero songs are downloaded.
2. **The balance decreases by $4 each day. The starting balance is $30.** The rate is -4, which means the balance drops $4 for each day. The initial value is 30.

CHALLENGE

The y-value rises 6 when x rises 3, so the rate of change is 2 per 1 x-value. The initial value is 14 because y = 14 when x = 0.

Accept equivalent wording such as “starts at” for initial value and “goes up” or “goes down” for rate of change. Students may state the rate as a signed number or describe its increase or decrease.