LESSON MAKER PRO

Linear Story Clues

Read rates and starting values from equations, data, and situations.

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."

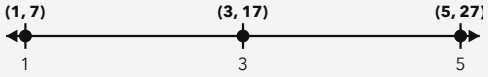
NAME _____ DATE _____

RATE AND START

In y = mx + b, m is the rate of change, and b is the initial value. On a graph, the rate is rise/run and the initial value is where the line crosses the y-axis. In a table, find the change in y for each change in x.

WORKED EXAMPLE

The labels show points on a linear function. Find the rate of change and initial value.



1. Find the rate: (17 - 7) / (3 - 1) = 5.
2. Use (1, 7): 7 = 5(1) + b.
3. Solve: b = 2.

Answer: Rate of change: 5. Initial value: 2.

PRACTICE 4 problems

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

ANSWER _____

2 A table has (0, 13), (4, 37), and (8, 61). State the rate of change and initial value.

ANSWER _____

3 A phone battery is 18% charged at 0 minutes. It loses 6 percentage points each minute. State the rate and initial value.

ANSWER _____

4 A graph crosses the y-axis at 14. It rises 16 units for a run of 4 units. State the rate of change and initial value.

ANSWER _____

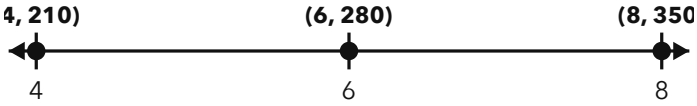
APPLY IT Show your work

1 A playlist starts with 16 songs. You add 4 songs each hour. What do the rate and initial value mean?

WORK SPACE

ANSWER _____

2 The labels show a video's total views at different times. Each label is (hours, total views). Find the rate of change and initial value. Explain what each means.



ANSWER _____

CHALLENGE One step up

Team Nova's points are shown in the table. Team Orbit's points follow y = x + 18. At which round will the teams have the same score? State the score and explain using both teams' rates and starting scores.

TEAM NOVA POINTS

Round	Points
0	6
4	22
8	38

WORK SPACE AND ANSWER

ANSWER KEY

Linear 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 (0, 13), (4, 37), and (8, 61). State the rate of change and initial value.	**Rate of change: 6. Initial value: 13.**
3	A phone battery is 18% charged at 0 minutes. It loses 6 percentage points each minute. State the rate and initial value.	**Rate of change: -6 percentage points per minute. Initial value: 18%.**
4	A graph crosses the y-axis at 14. It rises 16 units for a run of 4 units. State the rate of change and initial value.	**Rate of change: 4. Initial value: 14.**

PART 2 · APPLY IT

1. **The rate is 4 songs per hour. The initial value is 16 songs, the number in the playlist before any hours pass.** The playlist increases by 4 songs each hour. At hour 0, it has 16 songs.
2. **Rate of change: 35 views per hour. Initial value: 70 views, the number of views at hour 0.** The views increase by 70 in 2 hours, so the rate is 35 views per hour. Going back 4 hours from 210 views gives 70 views at hour 0.

CHALLENGE

They tie at round 4 with 22 points. Team Nova starts with 6 points and gains 4 points per round. Team Orbit starts with 18 points and gains 1 point per round, so Nova catches up after 4 rounds.

Accept equivalent wording for rate and initial value, including correct units. For the challenge, accept a correct equation comparison such as 4x + 6 = x + 18.