

Rate Check

Spot constant change in equations, tables, and real situations.

HIGH SCHOOL • HSF-LE.A.1b

CCSS.Math.Content.HSF-LE.A.1b "Recognize situations in which one quantity changes at a constant rate per unit interval relative to another."

NAME _____

DATE _____

THE BIG IDEA

A quantity has a constant rate of change when it changes by the same amount for every 1-unit change in the input. To test a table or two points, divide the change in output by the change in input and compare the rates.

WORKED EXAMPLE

A drone travels 85 meters in 5 seconds at a constant speed. What is its rate of change?

1. Rate = change in distance / change in time.
2. Rate = $85 / 5$.
3. Rate = 17 meters per second.

Answer: 17 meters per second

PRACTICE 6 problems

- 1** The table shows y for different x -values. x : 0, 2, 4, 6. y : 3, 9, 15, 21. Does y change at a constant rate? If yes, give the rate.

ANSWER _____

- 2** In the equation $y = -4x + 9$, what is the constant rate of change?

ANSWER _____

- 3** Find the rate of change shown by the points (1, 7), (4, 16), and (7, 25).

ANSWER _____

- 4** The table shows y for different x -values. x : 0, 2, 4, 6. y : 20, 28, 37, 45. Does y change at a constant rate? Explain briefly.

ANSWER _____

- 5** A gamer earns 7 coins for each quest completed. Do coins earned change at a constant rate compared with quests completed? Give the rate.

ANSWER _____

- 6** Which data set has a constant rate of change? Give its rate. A: Hours 0, 3, 6, 9; Pages 2, 11, 20, 29. B: Hours 0, 3, 6, 9; Pages 2, 12, 19, 29.

ANSWER _____

APPLY IT Show your work

- 1** A student edits short clips for a video portfolio. Each clip takes 18 minutes to edit. Write an equation for total editing time t in minutes for c clips. Then find the time for 7 clips and state the rate.

WORK SPACE

ANSWER _____

- 2** A student has \$30 in a savings account and deposits exactly \$14 each week. Write an equation for the balance B after w weeks. Find the balance after 6 weeks and state the constant rate.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A phone battery is tracked while it is being used. Time t in hours: 0, 3, 7, 10. Battery level B in percentage points: 92, 74, 50, 32. Does B change at a constant rate as t changes? Explain using the intervals, then write an equation for B in terms of t .

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	The table shows y for different x-values. x: 0, 2, 4, 6. y: 3, 9, 15, 21. Does y change at a constant rate? If yes, give the rate.	Yes, 3 y-units per x-unit.
2	In the equation $y = -4x + 9$, what is the constant rate of change?	-4 y-units per x-unit
3	Find the rate of change shown by the points (1, 7), (4, 16), and (7, 25).	3 y-units per x-unit
4	The table shows y for different x-values. x: 0, 2, 4, 6. y: 20, 28, 37, 45. Does y change at a constant rate? Explain briefly.	No. The changes in y are 8, 9, and 8 for equal changes of 2 in x.
5	A gamer earns 7 coins for each quest completed. Do coins earned change at a constant rate compared with quests completed? Give the rate.	Yes, 7 coins per quest.
6	Which data set has a constant rate of change? Give its rate. A: Hours 0, 3, 6, 9; Pages 2, 11, 20, 29. B: Hours 0, 3, 6, 9; Pages 2, 12, 19, 29.	Data set A, 3 pages per hour.

PART 2 • APPLY IT

- $t = 18c$; 126 minutes; 18 minutes per clip** Multiply the number of clips by 18 because each clip adds the same amount of editing time. For 7 clips, $t = 18(7) = 126$.
- $B = 30 + 14w$; \$114; \$14 per week** The starting balance is 30, and the balance increases by 14 for every week. Substitute $w = 6$ to get $B = 30 + 14(6) = 114$.

CHALLENGE

Yes. The rates are $(74 - 92) / (3 - 0) = -6$, $(50 - 74) / (7 - 3) = -6$, and $(32 - 50) / (10 - 7) = -6$ percentage points per hour. $B = 92 - 6t$.

Accept equivalent rate wording and units, including negative rates for decreasing quantities. For equations, accept equivalent forms such as $B - 92 = -6t$.