LESSON MAKER PRO

Rate Change Lab

Find how fast a function changes over an interval.

HIGH SCHOOL · HSF-IF.B.6

CCSS.Math.Content.HSF-IF.B.6 "Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. *"

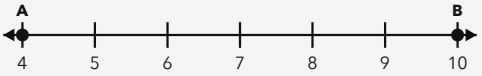
NAME _____ DATE _____

AVERAGE RATE OF CHANGE

For an interval from x = a to x = b, calculate average rate of change with (f(b) - f(a)) / (b - a). A positive result means the function increases overall, and a negative result means it decreases overall.

WORKED EXAMPLE

Use the marked endpoints to find the average rate of change of f(x) = 13x + 17.



1. f(4) = 13(4) + 17 = 69.
2. f(10) = 13(10) + 17 = 147.
3. (147 - 69) / (10 - 4) = 78 / 6 = 13.

Answer: 13

PRACTICE 4 problems

1 Find the average rate of change of f(x) = 3x + 2 from x = -2 to x = 2.

ANSWER _____

2 A table gives x: 2, 6 and q(x): -5, 15. Find the average rate of change from x = 2 to x = 6.

ANSWER _____

3 Find the average rate of change of $r(x) = x^2$ from x = -2 to x = 3.

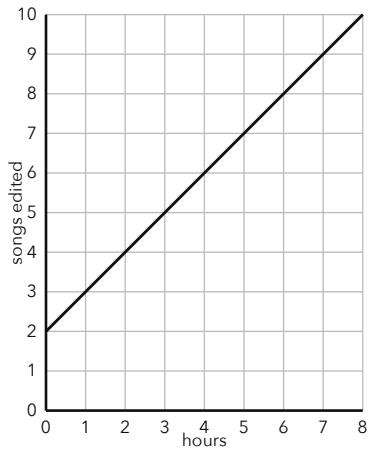
ANSWER _____

4 Find the average rate of change of g(x) = -6x + 5 from x = 0 to x = 2. Interpret the sign.

ANSWER _____

APPLY IT Show your work

1 The graph shows songs a student edited for a music project. What was the average rate of change from 0 to 6 hours?



ANSWER _____

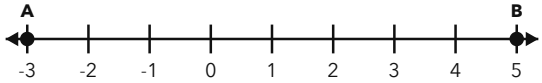
2 The number line marks times A and B during a creator's livestream. At A, the channel had 140 subscribers. At B, it had 260 subscribers. Find the average change in subscribers per hour.



ANSWER _____

CHALLENGE One step up

The number line marks an interval. For $p(x) = x^2 - 2x$, find the average rate of change from A to B. Explain why this does not mean p(x) stays constant on the interval.



WORK SPACE AND ANSWER

ANSWER KEY

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the average rate of change of f(x) = 3x + 2 from x = -2 to x = 2.	**3**
2	A table gives x: 2, 6 and q(x): -5, 15. Find the average rate of change from x = 2 to x = 6.	**5**
3	Find the average rate of change of $r(x) = x^2$ from x = -2 to x = 3.	**1**
4	Find the average rate of change of g(x) = -6x + 5 from x = 0 to x = 2. Interpret the sign.	**-6; g decreases 6 output units for each 1-unit increase in x.**

PART 2 · APPLY IT

1. **1 song per hour** Read the points (0, 2) and (6, 8). Compute (8 - 2) / (6 - 0) = 1.
2. **30 subscribers per hour** The time changes from 2 to 6 hours, or 4 hours. Compute (260 - 140) / 4 = 30.

CHALLENGE

0; p(-3) = 15 and p(5) = 15, so the endpoint change is 0. The quadratic changes between the endpoints, so it is not constant.

Accept equivalent fraction work and rate units. For interpretations, accept wording that correctly states increase or decrease per 1 unit of x.