Assignment

Write

Describe how the terms *constant difference*, *slope,* and *average rate of change* are related.

Remember

The explicit formula of an arithmetic sequence can be rewritten as a linear function in the general form $f(x) = ax + b$, where a and b are real numbers, using algebraic properties. The constant difference of an arithmetic sequence is always equal to the slope of the corresponding linear function.

Practice

1. Rakesha claims that the equation $f(n) = 5n - 7$ is the function notation for the sequence that is represented by the explicit formula $a_n = -2 + 5(n - 1)$. James doesn't understand how this can be the case.
   a. Help James by listing the steps to write the explicit formula of the given sequence in function notation. Provide a rationale for each step.
   b. Graph the function. Label the first 5 values of the sequence on the graph.

2. Determine whether each table of values represents a linear function. For those that represent linear functions, write the function. For those that do not, explain why not.

a.

x	$f(x)$
3	14
4	18
5	23
6	29

b.

x	$f(x)$
0	2
1	−1
2	−4
3	−7

c.

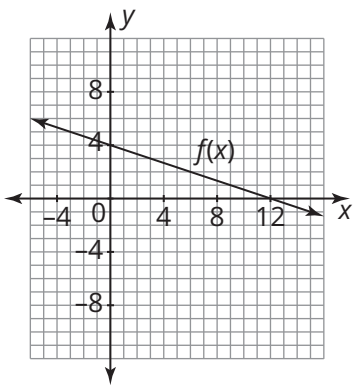
x	$f(x)$
1	11
2	16
3	21
4	26

3. Calculate the average rate of change for each linear function using the formula. Show your work.

a.

x	$f(x)$
3	−4
7	4
9	8
12	14

b.



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Stretch

Craig left his house at noon and drove 50 miles per hour until 3 PM. Then he drove the next 5 hours at 70 miles per hour. Graph Craig's driving trip and calculate the average rate of change for the entire trip.

Review

Evaluate each function for the given values.

1. $f(x) = 3x - 10$
   a. $f(0)$
   b. $f(5)$

2. $f(x) = 6$
   a. $f(0)$
   b. $f(-2)$

3. $f(x) = 9x + 7 - 3x$
   a. $f(0)$
   b. $f(0.5)$

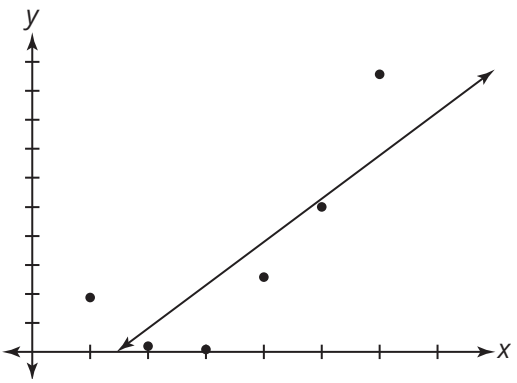
4. The linear regression equation for the given data is $y = -x + 19.7$. Complete the table for the linear regression equation, rounding your answers to the nearest tenth. Then construct and interpret a residual plot.

x	*y*	Predicted Value	Residual Value
2	17		
4	16		
6	15		
8	12		
10	9		
12	8		

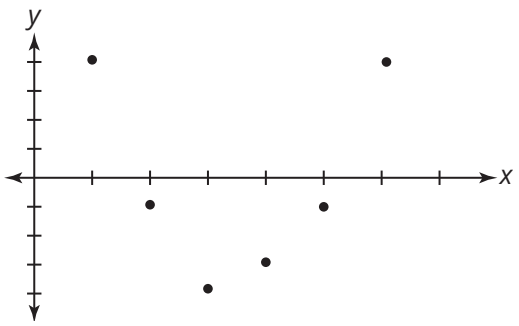
5. The linear regression equation for the given data is $y = 3.93x - 11.33$, $r = 0.8241$. Consider the scatterplot, the correlation coefficient, and the corresponding residual plot. State whether a linear model is appropriate for the data.

x	2	4	6	8	10	12
y	9	2	1	12	25	48

Scatter Plot and Line of Best Fit



Residual Plot



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