

TEST July 6!!!

TEST Review

How are arithmetic sequences and linear functions connected in theory?

What are the different ways that an arithmetic sequence can be defined?

Today's CCGPS Standards

MCC9-12.F.IF.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x . The graph of f is the graph of the equation $y = f(x)$. (*Draw examples from linear and exponential functions.*)

MCC9-12.F.IF.2 Use function notation, evaluates functions for inputs in their domains, and interprets statements that use function notation in terms of a context. (*Draw examples from linear and exponential functions*)

MCC9-12.F.IF.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; * (*Focus on linear and exponential functions.*)

MCC9-12.F.IF.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.* (*Focus on linear functions and intervals for exponential functions whose domain is a subset of the integers.*)

MCC9-12.F.IF.7a Graph linear functions and show intercepts, maxima, and minima

MCC9-12.F.IF.3 Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. (*Draw connection to F.BF.2, which requires you to write arithmetic and geometric sequences.*)

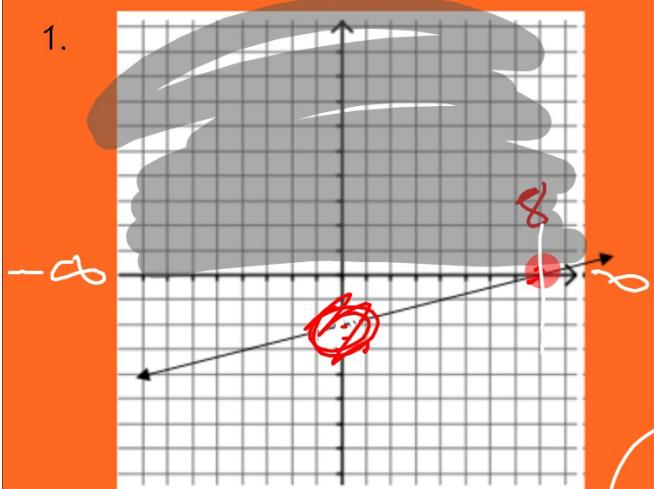
MCC9-12.F.BF.1 Write a function that describes a relationship between two quantities.* (*Limit to linear and exponential functions.*)

MCC9-12.F.BF.1a Determine an explicit expression, a recursive process, or steps for calculation from a context. (*Limit to linear and exponential functions.*)

MCC9-12.F.BF.2 Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.

MCC9-12.F.LE.1b Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.

1.



Fill in the information.

- A. Slope $\frac{1}{4}$
 B. Domain \mathbb{R}
 C. Range \mathbb{R}
 D. Increasing $-\infty, \infty$ Decreasing
 F. x-intercept $8, 0$
 G. y-intercept $0, -2$

Only x-axis

$\left\{ \begin{array}{l} \text{Positive} \\ [8, \infty) \end{array} \right.$	$\left\{ \begin{array}{l} \text{Negative} \\ (-\infty, 8] \end{array} \right.$
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2. Use the table at right to determine the rate of change for the interval $[0, 15]$.

$$(x_1, y_1) \quad (x_2, y_2)$$

$$\frac{11700 - 15000}{15 - 0} = -3300$$

Weeks(x)	Amount owed in dollars (f(x))
0	15000
5	13900
10	12800
15	11700
20	10600

$$ROC = -220$$

$$y = -220x + 15000$$

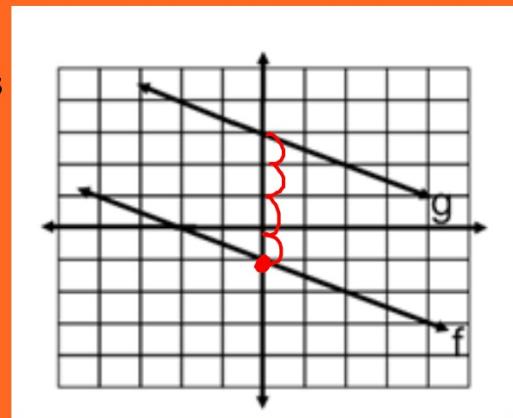
3. Given the graphs of $f(x)$ and $g(x)$ at right, which is the function rule for $g(x)$ in terms of $f(x)$?

A. $g(x) = f(x) + 6$

B. $g(x) = f(x) + 4$

C. $g(x) = f(x) - 2$

D. $g(x) = f(x) - 4$



$$g(x) = f(x) + 4$$

4. Discuss and compare the functions by analyzing the rates of change, intercepts, and where one function is greater or less than the other.

Store B: A rental store charges \$35 to rent a steam cleaner and \$5 for each hour.

$$y = 7x + 25$$

A.

Hours(x)	Total Cost (g(x))
3	46
4	53
5	60
6	67

(3, 46) (4, 53)

$$\frac{53 - 46}{4 - 3} \quad \frac{7}{1}$$

B.

$$\$7$$

$$5x + 35$$

Store A costs \$25 to rent but then \$7 per hour. Store B costs \$5 per hour but \$35 to rent. The slope is the cost per hour. The y-intercept is the initial cost to rent.

$$5. f(x) = -x + 1$$

Reflection none x-axis ~~y-axis~~

Dilation none vertical stretch vertical shrink

Vertical Shift Up 1

$$6. f(x) = \frac{5}{3}x - 15$$

Reflection none x-axis ~~y-axis~~

Dilation none vertical stretch vertical shrink

Vertical Shift down 15

Determine whether each sequence is finite or infinite.

7.) $10, 12, 14, \dots$ infinite

8.) $1, 5, 9, 13, \dots$ infinite

9.) $-99, -89, -79, -69$ finite

10.) $3.2, 4.3, 5.4, 6.5, 7.6$

finite

State the domain and range for each arithmetic sequence.

11.) $\begin{array}{cccc} 1 & 2 & 3 & 4 \\ 4, 12, 20, 28 \end{array}$

Domain: $\{1, 2, 3, 4\}$
Range: $\{4, 12, 20, 28\}$

12.) $-6, -9, -12, \dots$

Domain: \mathbb{R}
Range: \mathbb{R}

13.) $-3, 2, 7, 12, 17$

Domain: $\{1, 2, 3, 4, 5\}$
Range: $\{-3, 2, 7, 12, 17\}$

$y = mx + b$ $a_n = dn + b$
Write the explicit formula and find the given term in each arithmetic seq

14.) 100th term: 5, 8, 11, ... $a_n = 3n - 1$ $a_n = 3(100) - 1 = 299$

$$2 - 3 = -1$$

15.) 13th term: -1.1, 0.2, 1.5, ... $a_n = 1.3n - 2.4$ $a_n = 1.3(13) - 2.4$

$$-1.1 - 1.3$$

16.) 59th term: 34, 22, 10, ... $a_n = -12n + 46$ $a_n = -12(59) + 46 = 145$

$$34 - 22 = -12$$

$$34 + 12$$

$$-662$$

Find the first five terms of the following sequences using the recursive formula. What I add or subtract

$$17.) a_1 = 6, a_n = a_{n-1} + 9 \quad 6, 15, 24, 33, 42$$

First #

$$18.) a_1 = 100, a_n = a_{n-1} - 32 \quad 100, 68, 36, 4, -28$$

First #

$$19.) a_1 = 0, a_n = a_{n-1} - 4 \quad 0, -4, -8, -12, -16$$

First #

Given the recursive formula for a sequence, write an explicit formula to represent the sequence and find the requested term.

20.) $a_1 = 11$, $a_n = a_{n-1} - 10$

1st # Change $a_n = dn + b$

$11 - 10$

Explicit Formula: $a_n = -10n + 21$

18th term: $a_n = -10(18) + 21$
 -159

21.) $a_1 = 120$, $a_n = a_{n-1} - 2$

First # Change $a_n = dn + b$

$120 - 2 = 122$

Explicit Formula: $a_n = -2n + 122$

57th term: $a_n = -2(57) + 122$
 -8

22.) $a_1 = -14$, $a_n = a_{n-1} + 9$

1st # Change $a_n = dn + b$

$-14 + 9$

Explicit Formula: $a_n = 9n - 23$

100th term: $a_n = 9(100) - 23$
 877

Homework
Study for your
TEST

