

February 11, 2019, Monday

List 5 characteristics of the following graph.

1) $8x + 5y = 20$

x -intercept = 2.5
 y -intercept = 4
 rate of change = negative
 $m = -\frac{3}{2}$
 point on the line: (5, -4)

(hint: x -intercept, y -intercept, end behavior, rate of change (slope)....)

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Algebra 1 - U2B Day 2, 2/9/2018

Characteristics of Linear Functions Notes

Words to know:

- Domain: the values where the graph exists for x
- Range: the values where the graph exists for y
- Interval of Increase (↑) slope & Decrease (↓) slope: \pm intervals of y
- End Behavior: what the y -value approaches as $x \rightarrow \infty$, then $-\infty$
- x -intercept(s): where the graph crosses the x -axis
- y -intercept: where the graph crosses the y -axis

Examples:

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Average Rate of Change (ARC) Notes \rightarrow slope

Today's Question: How do we find the rate of change of a function? (SMAA)g

Rate of Change

- The rate of change is the ratio of the change of one quantity to a change in another quantity.
- Positive $m = 3$
- Negative $m = -4$
- Which function has a constant rate of change? linear function, line
- Horizontal Lines \rightarrow 0 rate of change
- Vertical Lines \rightarrow undefined (und.) rate of change

Constant Rate of Change

The slope of a non-vertical line is the ratio of the vertical (change $\rightarrow y_2 - y_1$) to the horizontal (change $\rightarrow x_2 - x_1$) between any two points on the line.

Example 1: Find the slope between (2, 4) and (6, 5).

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5 - 4}{6 - 2} = \frac{1}{4} = 0.25$$

Example 2: Find all rates of change between the points, then determine which has the greatest rate of change?

What is the value?

Interval $-6 \rightarrow -4 \rightarrow \frac{-5 - 0}{-4 - 0} = \frac{-5}{-4} = 1.25$

$-4 \rightarrow 3 \rightarrow \frac{-5 - 0}{-4 - 3} = \frac{-5}{-7} = 0.71$

$3 \rightarrow 6 \rightarrow \frac{7 - 0}{6 - 3} = \frac{7}{3} = 2.33$

$6 \rightarrow 8 \rightarrow \frac{7 - 0}{8 - 6} = \frac{7}{2} = 3.5$

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Algebra 1 - Day 2, 2/9/2018

Characteristics of Linear Functions HW Name _____

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Average Rate of Change HW

Directions: Identify the average rate of change for the given intervals.

1) Using the given graph, identify the average rate of change over the given intervals.

a) $x = -2$ to $x = -1$: $m = \frac{1 - 0.5}{-1 - (-2)} = \frac{0.5}{1} = 0.5$

b) $x = -1$ to $x = 0$: $m = \frac{2 - 1}{0 - (-1)} = \frac{1}{1} = 1$

c) $x = 0$ to $x = 1$

d) $x = -2$ to $x = 1$

2) Using the given table, identify the average rate of change over the given intervals.

x_1	x_2	y_1	y_2
1	2	3	6
2	10	3	10
3	10	3	10

a) $x = 2$ to $x = 3$: $m = \frac{6 - 3}{3 - 2} = \frac{3}{1} = 3$

b) $x = 0$ to $x = 4$: $m = \frac{34 - 4}{4 - 0} = \frac{30}{4} = 7.5$

c) $x = 2$ to $x = 3$: $m = \frac{10 - 3}{3 - 2} = \frac{7}{1} = 7$

d) $x = -1$ to $x = 4$

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February 12, 2019 Tuesday

Give an equation $y = -9x + 4$ identify the x & y intercepts, state the domain and range

x -intercept: 0.5
 y -intercept: 4
 domain: \mathbb{R}
 range: \mathbb{R}
 All real #s

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Algebra 1 - Even/Odd Functions in Class Assignment Name _____

1. Describe the symmetry of an **EVEN** function. **(180°)**
 graph: **y-axis symmetry** graph: **has origin symmetry**
 algebraic: **all exponents are even** algebraic: **all exponents are odd**

2. Describe each graph as EVEN, ODD, or NEITHER

3. Describe each function below as EVEN, ODD, or NEITHER

a. $f(x) = 2x^2$ **even**
 b. $g(x) = x^3 - 2x^4$ **ODD**
 c. $h(x) = x^3 + 3x^2 + 2x$ **NEITHER**
 d. $m(x) = x^4 + 3x^2 + 2$ **even**
 e. $p(x) = x^3$ **ODD**
 f. $q(x) = 5x^2$ **even**

If the partially graphed function below **(EVEN)** then finish what the rest of the graph should look like.

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Even and Odd Functions Notes

GRAPHICALLY:
 A function is **even** if **the function has y-axis**
 A function is **odd** if **the function has 180° symmetric origin symmetry**

NEITHER Even nor Odd:

ALGEBRAICALLY
 A function is **even** all exponents are even
 A function is **odd** all exponents are odd
 A function is **NEITHER** exponents are a mixture of even and odd
 BE CAREFUL because **-8** is an **EVEN EXPONENT**, (-8 can be written with a variable -8x^0 which makes it an even exponent)
 $2^7 = 128x^0$

Examples:

Even	Odd	Neither
$y = 10$ $y = 5x^0$ $y = 0.4x^0$	$y = x + x^3$ $y = x^3$ $y = x^5$	$y = x + x^2$ $x = x^0, x^3$ $y = x + 5x^2$

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Algebra 1 - Day 3, 2/12/2018 Arithmetic Sequences Notes

Arithmetic Sequences are **a function with a common diff**
 The recursive formula is $a_n = a_{n-1} + d$ & helps you find **small n's**
 The explicit formula is $a_n = a_1 + d(n-1)$ & helps you find **large n's**

Examples: Find the common difference, then write the recursive formula & the explicit formula.

Sequence	Common Difference	Recursive Formula	Explicit Formula
31, 35, 39	4	$a_n = a_{n-1} + 4$	$a_n = 27 + 4(n-1)$
3, -10, -17	-7	$a_n = a_{n-1} - 7$	$a_n = 4 - 7(n-1)$

Find the first five terms of the arithmetic sequence defined as follows:
 $a_1 = 2.7n + 0.5$
 $n = 1$ (first term) $a_1 = 2.7(1) + 0.5 = 3.2$
 $n = 2$ (2nd term) $a_2 = 2.7(2) + 0.5 = 5.9$
 $n = 3$ $a_3 = 2.7(3) + 0.5 = 8.6$
 $n = 4$ $a_4 = 2.7(4) + 0.5 = 11.3$
 $n = 5$ $a_5 = 2.7(5) + 0.5 = 14$

Find the first five terms of the arithmetic sequence defined as follows:
 $a_1 = -2n - 22$; $a_1 = 18$
 $n = 2$ $a_2 = a_1 - 22$
 $a_2 = 18 - 22 = -4$
 $n = 3$ $a_3 = a_2 - 22$
 $a_3 = -4 - 22 = -26$
 $n = 4$ $a_4 = a_3 - 22$
 $a_4 = -26 - 22 = -48$

You have read 25 pages of a book. You plan to read an additional 10 pages each night.
 a. List the first five terms of the sequence.
 $a_1 = 25$ $a_2 = 35$ $a_3 = 45$ $a_4 = 55$ $a_5 = 65$

b. Write the explicit formula to represent the number of pages you will read after n nights.
 $a_n = a_1 + d(n-1)$
 $a_n = 25 + 10(n-1)$

You are going on vacation. You have \$100 to bring with you. You expect to spend \$15 each day. You want to have \$20 remaining at the end of the vacation.
 a. Write an explicit formula to represent this scenario.
 $a_n = a_1 + d(n-1)$
 $a_n = 105 + 5(n-1)$

b. For how many days can you spend \$15 each day?
 $a_1 = 105$ $a_4 = 60$
 $a_2 = 90$ $a_5 = 45$
 $a_3 = 75$ $a_6 = 30$ **days = 6**

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Find the first five terms of the arithmetic sequence defined as follows:
 $a_n = a_{n-1} - 22$; $a_1 = 18$

$n = 1$ $a_1 = 18$
 $n = 2$ $a_2 = a_1 - 22$
 $a_2 = 18 - 22 = -4$
 $n = 3$ $a_3 = a_2 - 22$
 $a_3 = -4 - 22 = -26$
 $n = 4$ $a_4 = a_3 - 22$
 $a_4 = -26 - 22 = -48$

Feb 12-9:59 AM

February 13, 2019 Wednesday

even, odd or neither?

1) **Even**

2) **Neither**

3) $f(x) = x^3 - 5x^5$ **Odd**

Determine if the sequence is arithmetic. If it is, find the common difference.

1) 107, 100, 107, 107, 107
 -107 10777 10777
 -107 -1077
 970 9700 **NO**

2) 35, 15, -5, -25, -45
 $15 - 5 = -25$
 $-35 - 15 = -50$
 $-20 - 20 = -40$ **d = -20**

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Algebra 1 - Day 3, 2/12/2018 Arithmetic Sequences HW Name _____ $d = 7 - 4 = 3$

1. Write the recursive and the explicit formula for the sequence:
 $R: a_1 = 4$ $a_n = a_{n-1} + 3$ $E: a_n = 4 + (n-1)3$

2. What is the common difference for the following sequences: -5, -12, -19, -26
 $d = -12 - (-5) = -7$

3. The first four terms of a sequence are 2, 12, 22, 32...
 a) What is the recursive formula for the sequence?
 $a_1 = 2$ $a_n = a_{n-1} + 10$
 b) Write the explicit formula for the sequence.
 $a_n = 2 + (n-1)10$

c) What is the 30th term in the sequence? $a_{30} = ?$
 $n = 30$
 $a_{30} = 2 + (30-1)10$
 $a_{30} = 292$

4. You have donated \$100 to a charity. You plan to donate an additional \$17 each month.
 a) Write the first five terms of the sequence.
 $a_1 = 100$ $a_2 = 117$ $a_3 = 134$ $a_4 = 151$ $a_5 = 168$
 b) Write an explicit formula to represent the sequence.
 $a_n = 100 + (n-1)17$

5. An arithmetic sequence is given by the following table. Write the recursive formula and the explicit formula for the sequence.

n	1	2	3	4
a_n	10	13	16	19

$d = 10 - 3 = 13 - 10 = 3$
 $R: a_1 = 10$ $a_n = a_{n-1} + 3$ $E: a_n = 10 + (n-1)3$

6. An arithmetic sequence is given by the following formula: $a_n = a_{n-1} + 7$, $a_1 = 2$
 a) Find the first 5 term of the sequence.
 $a_1 = 2$
 $a_2 = 9$
 $a_3 = 16$
 $a_4 = 23$
 $a_5 = 30$

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Even/Odd Functions HW/Practice Tell whether the function is even, odd, or neither.

Even: $f(x) = x^2$, $f(x) = x^4$, $f(x) = x^6$
 Odd: $f(x) = x^3$, $f(x) = x^5$, $f(x) = x^7$
 Neither: $f(x) = x^2 + x$, $f(x) = x^2 + x^3$, $f(x) = x^2 + x^4$
 Can a linear function ever be even or odd? No. If so, sketch an example.

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Algebra 1 Unit 2B Test - Study Guide

1. For the given function $f(x) = 2x + 7$, find $f(-2)$.
 $f(-2) = 2(-2) + 7 = -4 + 7 = 3$

2. For the given function $f(x) = 4x - 6$, which x value would make $f(x) = 10$?
 $10 = 4x - 6$
 $16 = 4x$
 $4 = x$

3. In the following table, find the domain of the function.

$f(x) = 2x^2 - 3$	$f(x) = \frac{1}{x}$
$f(x) = x^2 + 1$	$f(x) = x^2 + 1$
$f(x) = x^2 + 1$	$f(x) = x^2 + 1$
$f(x) = x^2 + 1$	$f(x) = x^2 + 1$
$f(x) = x^2 + 1$	$f(x) = x^2 + 1$
$f(x) = x^2 + 1$	$f(x) = x^2 + 1$
$f(x) = x^2 + 1$	$f(x) = x^2 + 1$
$f(x) = x^2 + 1$	$f(x) = x^2 + 1$
$f(x) = x^2 + 1$	$f(x) = x^2 + 1$
$f(x) = x^2 + 1$	$f(x) = x^2 + 1$

Linear Characteristics
 4. Graph the function and determine the key characteristics.
 $f(x) = 2x + 4$

Domain: \mathbb{R}
 Range: \mathbb{R}
 x-intercept: -2 on $(-2, 0)$
 y-intercept: 4 on $(0, 4)$
 Increasing? Yes
 Decreasing? No
 End Behavior: $y \rightarrow \infty$ as $x \rightarrow \infty$, $y \rightarrow \infty$ as $x \rightarrow -\infty$

5. What is $f(3)$ when $f(x) = 3x - 4$?
 $f(3) = 3(3) - 4 = 9 - 4 = 5$

6. What is the domain of the function?
 \mathbb{R}

7. What is the end-behavior, as x approaches positive infinity of the function model?
 $f(x) \rightarrow \infty$ as $x \rightarrow \infty$

8. Write the function being modeled by the above graph.
 $y = mx + b$
 $f(x) = mx + b$
 $f(x) = 3x - 4$

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Rate of Change

9. Find the rate of change of the following ordered pairs: $(10, 3)$ and $(15, 10)$.
 $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{10 - 3}{15 - 10} = \frac{7}{5}$

10. Find the slope of the function $3x - 6y = 12$.
 $y = mx + b$
 $-6y = -3x + 12$
 $y = \frac{1}{2}x - 2$
 $m = \frac{1}{2}$

11. The tables below model two linear functions.

x	f(x)
4	3
5	4
6	5

$m = \frac{4 - 3}{5 - 4} = 1$
 $f(x) = x - 1$

x	f(x)
2	4
3	5
4	6

$m = \frac{5 - 4}{3 - 2} = 1$
 $f(x) = x + 2$

Which of the linear functions below has a slope greater than the slope for Function 1 but less than the slope for Function 2?
 a. $f(x) = 2x - 3$
 b. $f(x) = x + 4$
 c. $f(x) = 2x + 3$
 d. $f(x) = x + 6$

Arithmetic Sequence

12. The table to the right shows the relationship between the number of a term in a pattern and the value of that term. Write a formula to represent the table.

Term Number	Value of Term
1	2
2	5
3	8
4	11
5	14
6	17
7	20

$a_1 = 2$, $d = 3$
 $a_n = a_1 + (n-1)d$
 $a_n = 2 + (n-1)3$
 $a_n = 3n - 1$

13. The second term of an arithmetic sequence is $a_2 = 24$. The common difference is $d = -3$. Find the first term of the sequence.
 $a_2 = a_1 + d$
 $24 = a_1 - 3$
 $a_1 = 27$

14. Pizza King sells pizzas for \$6 per pizza. Write a function to model this situation.

a. How much money do you owe Pizza King for ordering 25 pizzas?
 $a_{25} = 4 + 6(25) = 154$

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February 14, 2019, Thursday

1&2) For $f(x) = 3x + 2$, find $f(x)$ when $x = 7$ and when $x = -4$.
 $f(7) = 3(7) + 2 = 23$
 $f(-4) = 3(-4) + 2 = -10$

3) Evaluate the following function when $x = 0$.
 $f(x) = 2x + 3$
 $f(0) = 2(0) + 3 = 3$

4) Evaluate the following function when $f(x) = 5$.
 $f(x) = 2x - 3$
 $5 = 2x - 3$
 $8 = 2x$
 $4 = x$

Common Difference for Arithmetic Sequence: 2, 4, 6, 8, ...
 Arithmetic Recursive Formula (for small n):
 $a_1 = a$
 $a_n = a_{n-1} + d$
 Arithmetic Explicit Formula (for large n):
 $a_n = a + (n-1)d$

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15. Find a_5 for the sequence $a_n = 2n + 5$.
 $a_5 = 2(5) + 5 = 15$

16. Write a function that could be used to represent the sequence: $a_n = 2n - 12$.
 $a_n = 2n - 12$

17. Find a_{30} for the sequence $a_n = 2n - 12$.
 $a_{30} = 2(30) - 12 = 48$

Determine if the following are even, odd, or neither. \rightarrow mixture even & odd exponents.

16. $f(x) = -5x^4 + 3x^2 + 8$ NEITHER
 17. $f(x) = 2x^3 + 1$ ODD
 18. $f(x) = 2x^4 + 7x^2$ EVEN

19. even
 20. odd
 21. NEITHER

22. Jalen makes \$14 per hour babysitting plus a flat rate of \$5 for gas. Write the function. Name the slope and y-intercept.
 $f(x) = 14x + 5$ $m = 14$ $f(x) = mx + b$ $b = 5$

23. For the following table: each input has exactly one output

x	1	2	3	4	5	6
y	10	14	18	22	26	30

a) Is the relation a function? Yes
 b) What is the domain? x values: 1, 2, 3, 4, 5, 6
 c) What is the range? y values: 10, 14, 18, 22, 26, 30
 d) What is the rate of change? ROC, m : $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{14 - 10}{2 - 1} = 4$

26. Determine if the following are functions:
 a) NOT A FUNCTION
 b) FUNCTION

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State if each sequence is arithmetic. 1-8

Find the common difference. 9-16

Determine if the sequence is arithmetic. If it is, find the three terms in the sequence after the last one given. 17-24

Determine if the sequence is arithmetic. If it is, find the recursive formula. 25-32

Find the explicit formula. 33-40

Find the term named in the problem and the explicit formula. 41-48

Algebra 1 Unit 2B Test - Study Guide

Practice with Arithmetic Sequences

Name: _____ ID: _____
 Date: _____ Period: _____

State if each sequence is arithmetic.

1) 1, 5, 25, 125, ...
 2) -1, -4, -17, -35, ...

3) -1, -4, -16, -64, ...
 4) -27, 3, 31, 63, ...

5) -30, -14, -4, -2, ...
 6) -7, -16, -25, -34, ...

7) -8, -8, -8, -8, ...
 8) -1, 1, 5, 13, ...

Find the common difference.

9) 35, 41, 47, 53, ...
 10) 16, 13, 10, 7, ...

11) 28, 33, 37, 41, ...
 12) 7, 1, -5, -13, ...

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13) -7, 1, 9, 17, ... 14) -34, -39, -44, -49, ...

15) 16, 6, -4, -14, ... 16) 8, 28, 48, 68, ...

Determine if the sequence is arithmetic. If it is, find the three terms in the sequence after the last one given.

17) -36, -32, -28, -24, ... 18) 42, 421, 4211, 42111, ...

19) -5, -3, 0, 4, ... 20) 32, 34, 36, 38, ...

21) 3, 1, -1, -3, ... 22) 1, 9, 25, 49, ...

23) -1, -2, -4, -8, ... 24) 16, 12, 8, 4, ...

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Determine if the sequence is arithmetic. If it is, find the recursive formula.

25) -16, -6, 4, 14, ... 26) -30, -50, -70, -90, ...

27) 37, 30, 23, 16, ... 28) 17, 8, -1, -10, ...

29) -14, -8, -2, 4, ... 30) -40, -49, -58, -67, ...

31) 1, 10, 19, 28, ... 32) -29, -22, -15, -8, ...

Find the explicit formula.

33) -23, -25, -27, -29, ... 34) -36, 64, 164, 264, ...

35) -24, -33, -42, -51, ... 36) 4, 104, 204, 304, ...

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Determine if the sequence is arithmetic. If it is, find the recursive formula.

25) -16, -6, 4, 14, ... 26) -30, -50, -70, -90, ...

27) 37, 30, 23, 16, ... 28) 17, 8, -1, -10, ...

29) -14, -8, -2, 4, ... 30) -40, -49, -58, -67, ...

31) 1, 10, 19, 28, ... 32) -29, -22, -15, -8, ...

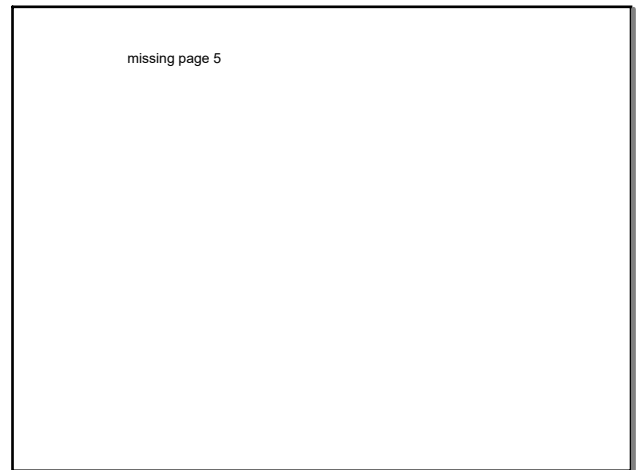
Find the explicit formula.

33) -23, -25, -27, -29, ... 34) -36, 64, 164, 264, ...

35) -24, -33, -42, -51, ... 36) 4, 104, 204, 304, ...

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Feb 14-8:54 AM

Function Notation NAME: _____
DATE: _____

1. Evaluate the following expressions given the functions below:

$g(x) = -3x + 1$ $f(x) = x^2 + 7$ $h(x) = \frac{12}{x}$ $j(x) = 2x + 9$

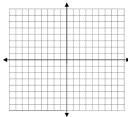
a. $g(10) =$ b. $f(3) =$ c. $h(-2) =$

d. $f(7) =$ e. $h(x) =$ f. $g(x) =$

b. Find x if $g(x) = 16$ i. Find x if $h(x) = -2$ j. Find x if $f(x) = 23$

2. Change the following statements into coordinate points and then plot them!

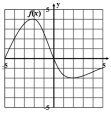
a. $f(-1) = 1$
b. $f(2) = 7$
c. $f(1) = -1$
d. $f(3) = 0$



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3. Given this graph of the function $f(x)$:



Find:

a. $f(-4) =$ b. $f(0) =$ c. $f(3) =$ d. $f(-5) =$

e. x when $f(x) = -2$ f. x when $f(x) = 0$

APPLICATION

4. Swine flu is attacking the North Pole. The function below determines how many elves have swine flu where t = time in days and S = the number of people in thousands.

$S(t) = 9t - 4$

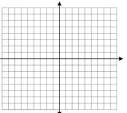
a. Find $S(4)$.

b. What does $S(4)$ mean?

c. Find t when $S(t) = 23$.

d. What does $S(t) = 23$ mean?

e. Graph the function.



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February 15, 2019, Friday


1. Evaluate the following expressions given the functions below:

$g(x) = -3x + 1$ $f(x) = x^2 + 7$ $h(x) = \frac{12}{x}$ $j(x) = 2x + 9$

a. $g(10) =$ b. $f(3) =$ c. $h(-2) =$

h. Find x if $g(x) = 16$ i. Find x if $h(x) = -2$

...test



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