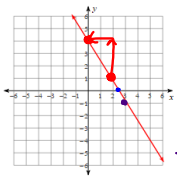
February 11, 2019, Monday

List 5 chractieristics of the following graph.

1) $8x + 5y = 20$



x-intercept: 2.5 or (2.5,0)
y-intercept: 4 or (0,4)
rate of change (slope) = —
Slope, $m = -\frac{3}{2}$
point (3,-1)

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

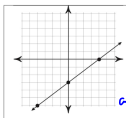
Feb 6-3:47 PM

Algebra 1 ~ U2B Day 2, 2/9/2018 Characteristics of Linear Functions Notes

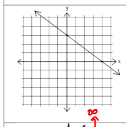
Words to know:

- Domain: the values where the graph exists for x
- Range: the values where the graph exists for y
- Interval of Increase (+ slope) & Decrease (− slope): in terms of y
- End Behavior: what the y value approaches as x→∞, then as x→−∞
- x-intercept(s): where the graph crosses the x-axis
- y-intercept: where the graph crosses the y-axis

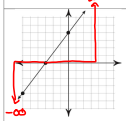
Examples:



Domain: All real numbers
Range: ℝ
Interval: increases $(-\infty,\infty)$
End Behavior: As x→−∞, f(x)→−∞ (approaches); As x→∞, f(x)→∞
x-intercept: 4 or (4,0)
y-intercept: −3 or (0,−3)



Domain: ℝ
Range: ℝ
Interval: decreasing $(-\infty,\infty)$
End Behavior: As x→−∞, f(x)→∞; As x→∞, f(x)→−∞
ℝ for all linear graph
x-intercept: 4 or (4,0)
y-intercept: 3 or (0,3)



Domain: ℝ
Range: ℝ
Interval: increasing $(-\infty,\infty)$
End Behavior: As x→−∞, f(x)→−∞; As x→∞, f(x)→∞
x-intercept: (−3,0)
y-intercept: (0,4)

Feb 6-3:49 PM

Average Rate of Change (AROC) Notes

Today's Question: How do we find the rate of change of a function? (MM1A1g)

Rate of Change, ROC, = slope, m

- The rate of change is the ratio of the change of one quantity to a change in another quantity.
- Positive ~ m = 3, m = ⅓
- Negative ~ m = −4, m = −¼
- Which function has a constant rate of change? A line!
- Horizontal Lines ~ ↔ 0 is the roc, m = 0
- Vertical Lines ~ ↕ undefined is the roc, m = und

Constant Rate of Change

The **slope** of a non-vertical line is the ratio of the vertical (change Y) to the horizontal (change X) between any two points on the line.

$$m = \frac{\text{change in } y}{\text{change in } x} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$$

Example 1: Find the slope between (2, 4) and (4, 8).

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{8-4}{4-2} = 2$

Example 2: The table shows the amount of water evaporating from a swimming pool on a hot day. Find the rate of change between 2 hours and 6 hours.

Time (hours)	x	2	6	12
Gallons evaporated	y	13.5	9	27

$m = \frac{13.5-4.5}{6-2} = 2.25$

Example 3: Find all rates of change between the points, then determine which has the greatest rate of change?

What is the value?

$x = -8 \to -4$ $m = \frac{5-0}{-4-(-8)} = \frac{5}{4} = 1.2$

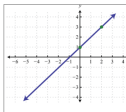
$x = -4 \to 3$ $m = \frac{5-0}{-4-3} = \frac{-5}{7} = -.71$

$x = 3 \to 6$ $m = \frac{7-0}{6-3} = \frac{7}{3} = 2.3$

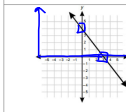
$x = 6 \to 8$ $m = \frac{7-0}{6-8} = \frac{-7}{2} = -3.5$

Feb 6-3:49 PM

Algebra 1 ~ Day 2, 2/9/2018 Characteristics of Linear Functions HW Name

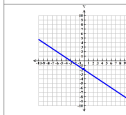


Domain: ℝ
Range: ℝ
Interval: increases
End Behavior: As x→−∞, f(x)→−∞; As x→∞, f(x)→∞
x-intercept: −1 (−1,0)
y-intercept: 1 (0,1)



Domain: ℝ
Range: ℝ
Interval: decreasing
End Behavior: As x→−∞, f(x)→∞; As x→∞, f(x)→−∞
x-intercept: 3 (3,0)
y-intercept: 4 (0,4)

Domain: ℝ
Range: ℝ
Interval: increasing
End Behavior: As x→−∞, f(x)→−∞; As x→∞, f(x)→∞
x-intercept: 0.5 (0.5,0)
y-intercept: 0,1



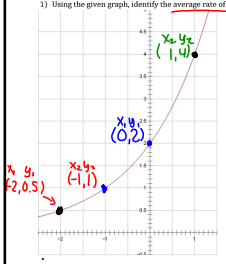
Domain: ℝ
Range: ℝ
Interval: decreases
End Behavior: As x→−∞, f(x)→∞; As x→∞, f(x)→−∞
x-intercept: −3 (−3,0)
y-intercept: (0,−2)

Feb 6-3:50 PM

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. $m = \frac{1-0.5}{-1-2} = 0.5$

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

c) x = 0 to x = 1. $m = \frac{4-2}{1-0} = 2$

d) x = -2 to x = 1. $m = \frac{4-0.5}{1-2} = 1.17$

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

x	y
0	3
1	6
2	10
3	18
4	34

a) x = -1 to x = 1. $m = \frac{6-3}{1-(-1)} = \frac{3}{2} = 1.5$

b) x = 0 to x = 4. 15/2 = 7.5

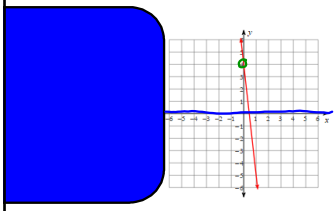
c) x = 2 to x = 3.

d) x = -1 to x = 4.

Feb 6-3:50 PM

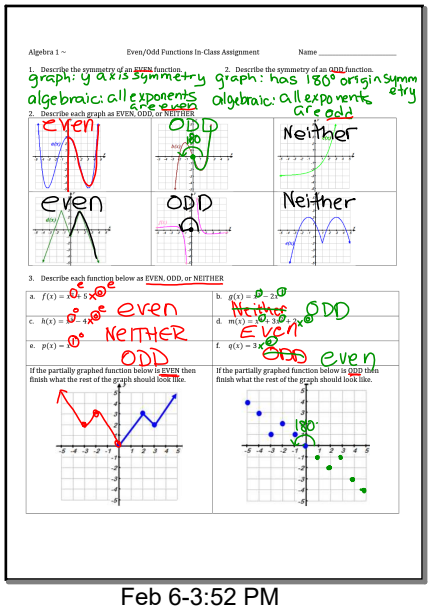
February 12, 2019 Tuesday

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



x-intercept: 0.5
y-intercept: 4
domain: ℝ
range: ℝ

Feb 6-3:55 PM



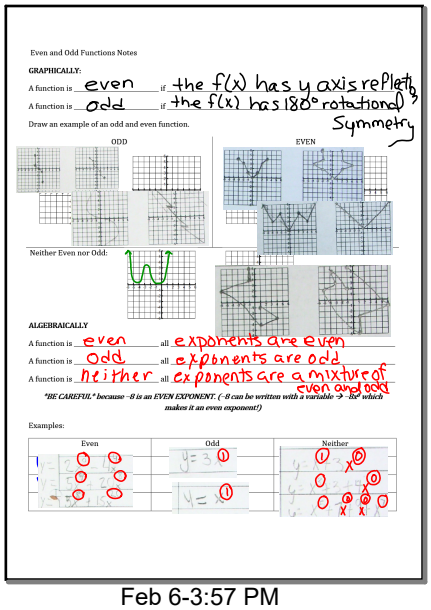
Feb 6-3:52 PM

Test Review

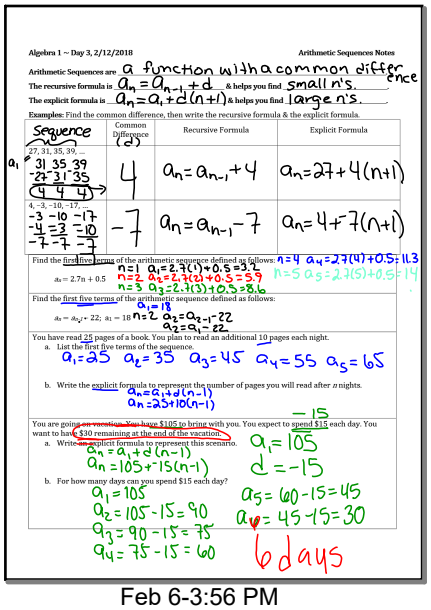
28) $c + a = 90$: quantity

$3c + 5a = 328$: price

Feb 12-11:18 AM



Feb 6-3:57 PM



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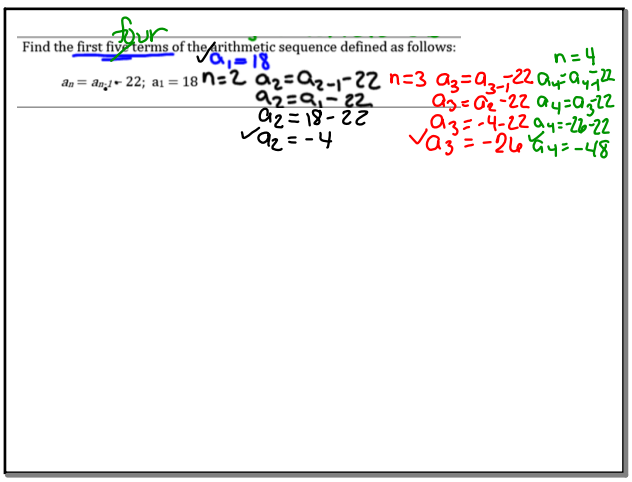
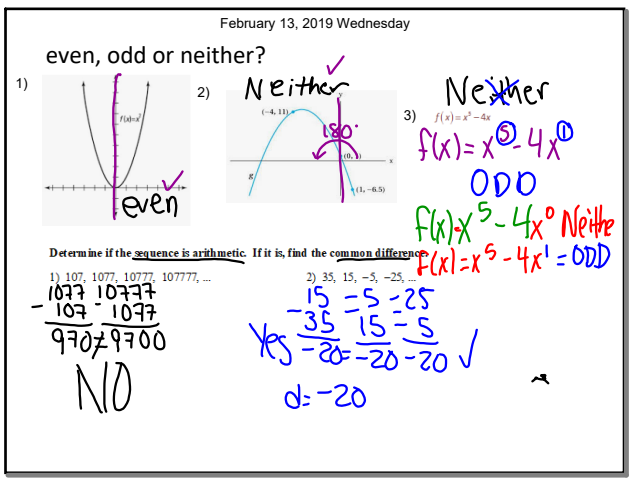


Feb 12-11:31 AM



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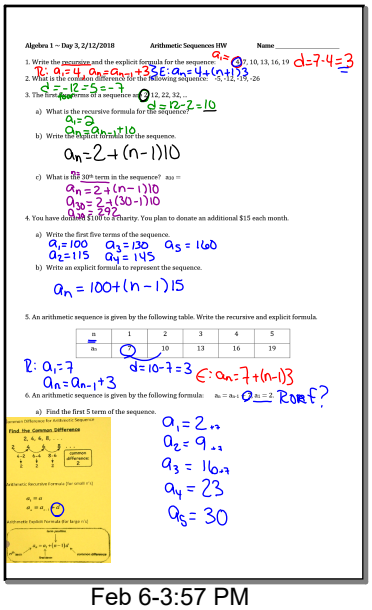

Algebra 1 ~ Day 3, 2/12/2018 Arithmetic Sequences HW Name

1. Write the recursive and the explicit formula for the sequence: 7, 10, 13, 16, 19

2. What is the common difference for the following sequence: -5, -12, -19, -26

3. The first four terms of a sequence are 12, 22, 32, ...

a) What is the recursive formula for the sequence?

b) Write the explicit formula for the sequence.

c) What is the 30th term in the sequence? a_{30} =

4. You have donated $100 to a charity. You plan to donate an additional $15 each month.

a) Write the first five terms of the sequence.

b) Write an explicit formula to represent the sequence.

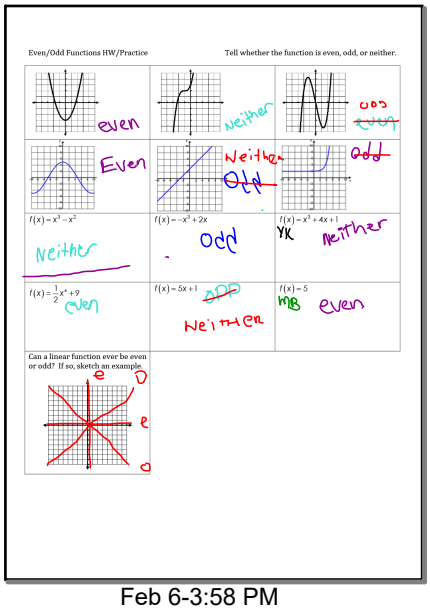
5. An arithmetic sequence is given by the following table. Write the recursive and explicit formula.

n	1	2	3	4	5
a_n	7	10	13	16	19

6. An arithmetic sequence is given by the following formula: $a_n = a_{n-1} + 2$, $a_1 = 3$

a) Find the first 5 term of the sequence.

Feb 6-3:57 PM


Even/Odd Functions HW/Practice

Tell whether the function is even, odd, or neither.

$f(x) = x^3 - x^2$

$f(x) = -x^3 + 2x$

$f(x) = x^3 + 4x + 1$

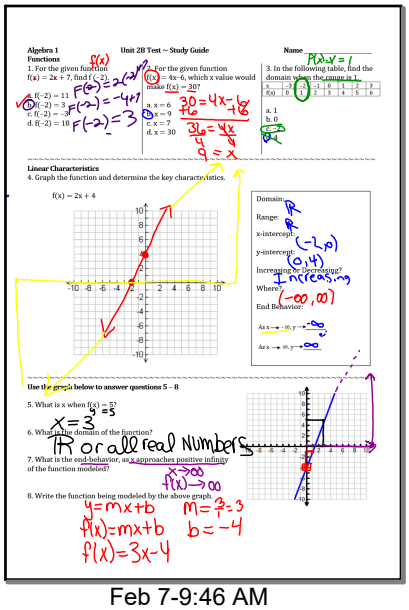
$f(x) = \frac{1}{2}x^4 + 9$

$f(x) = 5x + 1$

$f(x) = 5$

Can a linear function ever be even or odd? If so, sketch an example.

Feb 6-3:58 PM


Algebra 1 Unit 2B Test ~ Study Guide Name

Functions

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

2. For the given function $f(x) = 4x - 6$, which x value would make $f(x) = 30$?

3. In the following table, find the domain when the range is 1.

Linear Characteristics

4. Graph the function and determine the key characteristics.

$f(x) = 2x + 4$

Domain:

Range:

x-intercept:

y-intercept:

Increasing or Decreasing?

Where:

End Behavior:

As $x \to -\infty$, $y \to$

As $x \to \infty$, $y \to$

Use the graph below to answer questions 5 – 8

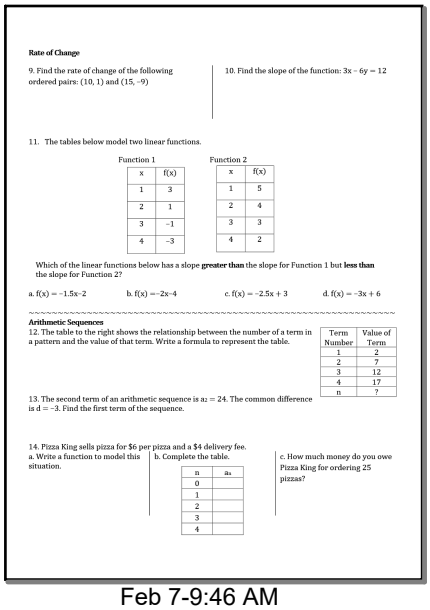
5. What is x when $f(x) = 5$?

6. What is the domain of the function?

7. What is the end-behavior, as x approaches positive infinity of the function modeled?

8. Write the function being modeled by the above graph.

Feb 7-9:46 AM


Rate of Change

9. Find the rate of change of the following ordered pairs: (10, 1) and (15, -9)

10. Find the slope of the function: $3x - 6y = 12$

11. The tables below model two linear functions.

Function 1

x	f(x)
1	3
2	1
3	-1
4	-3

Function 2

x	f(x)
1	5
2	4
3	3
4	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. $f(x) = -1.5x - 2$ b. $f(x) = -2x - 4$ c. $f(x) = -2.5x + 3$ d. $f(x) = -3x + 6$

Arithmetic Sequences

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	7
3	12
4	17
n	?

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.

14. Pizza King sells pizza for $6 per pizza and a $4 delivery fee.

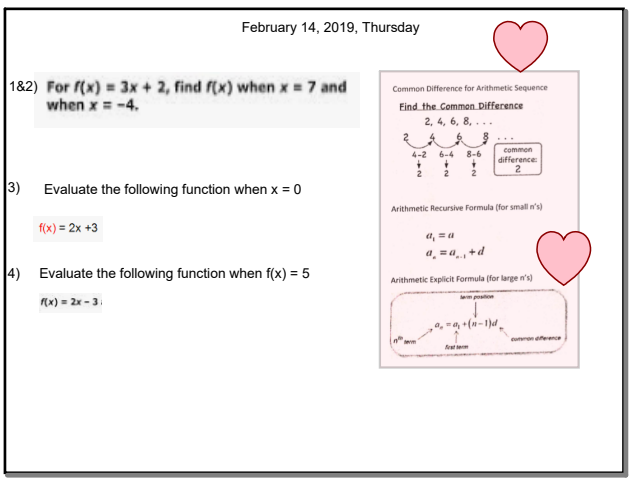
a. Write a function to model this situation.

b. Complete the table.

n	a_n
0	
1	
2	
3	
4	

c. How much money do you owe Pizza King for ordering 25 pizzas?

Feb 7-9:46 AM


February 14, 2019, Thursday

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

3) Evaluate the following function when x = 0

$f(x) = 2x + 3$

4) Evaluate the following function when f(x) = 5

$f(x) = 2x - 3$

Common Difference for Arithmetic Sequence

Find the Common Difference

2, 4, 6, 8, . . .

common difference: 2

Arithmetic Recursive Formula (for small n's)

$a_1 = a$

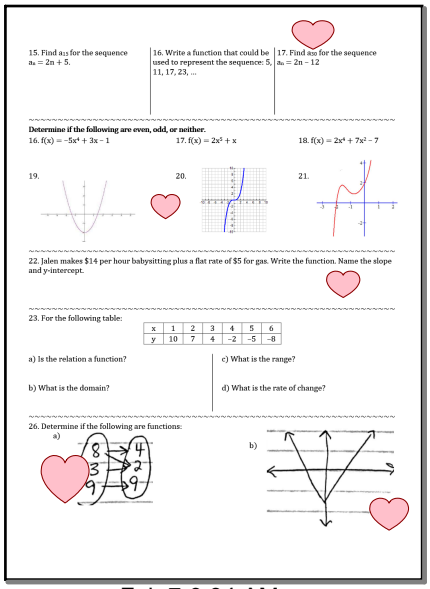
$a_n = a_{n-1} + d$

Arithmetic Explicit Formula (for large n's)

$a_n = a_1 + (n-1)d$

term position, n^{th} term, first term, common difference

Feb 6-3:59 PM


15. Find a_{13} for the sequence $a_n = 2n + 5$.

16. Write a function that could be used to represent the sequence: 5, 11, 17, 23, ...

17. Find a_{20} for the sequence $a_n = 2n - 12$

Determine if the following are even, odd, or neither.

16. $f(x) = -5x^4 + 3x - 1$

17. $f(x) = 2x^5 + x$

18. $f(x) = 2x^4 + 7x^2 - 7$

19.

20.

21.

22. Jalen makes $14 per hour babysitting plus a flat rate of $5 for gas. Write the function. Name the slope and y-intercept.

23. For the following table:

x	1	2	3	4	5	6
y	10	7	4	-2	-5	-8

a) Is the relation a function?

b) What is the domain?

c) What is the range?

d) What is the rate of change?

26. Determine if the following are functions:

a)

b)

Feb 7-9:34 AM

Algebra I Name_____ ID: 1

Practice with Arithmetic Sequences Date_____ Period____

State if each sequence is arithmetic.

1) 1, 5, 25, 125, ...

2) −1, −9, −17, −25, ...

3) −1, −4, −16, −64, ...

4) −27, 3, 33, 63, ...

5) −30, −14, −6, −2, ...

6) −7, −16, −25, −34, ...

7) −40, −48, −56, −64, ...

8) −1, 1, 5, 13, ...

Find the common difference.

9) 35, 41, 47, 53, ...

10) 16, 13, 10, 7, ...

11) 29, 33, 37, 41, ...

12) 7, 1, −5, −11, ...

Feb 7-9:26 AM

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, ...

Feb 7-9:33 AM

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, ...

Feb 7-9:33 AM

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 7-9:33 AM

NAME:_____

Function Notation DATE:_____

1. Evaluate the following expressions given the functions below:

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

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

d. $f(7) =$ **e.** $h(a)$ **f.** $g(b+c)$

h. 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. $f(-1) = 1$

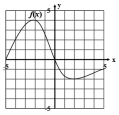
b. $f(2) = 7$

c. $f(1) = -1$

d. $f(3) = 0$

Feb 7-11:11 AM

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.

$S(t) = 9t - 4$

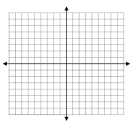
a. Find $S(4)$.

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

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

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

e. Graph the function.



Feb 7-11:11 AM

February 15, 2019, Friday

...test (buddy?)

Feb 7-9:48 AM

Feb 7-9:48 AM