

**Algebra 1
Functions**

Unit 2B Test ~ Study Guide

Name key

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

- a. $f(-2) = 11$
- b. $f(-2) = 3$
- c. $f(-2) = -3$
- d. $f(-2) = 18$

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

- a. $x = 6$
- b. $x = 9$
- c. $x = 7$
- d. $x = 30$

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

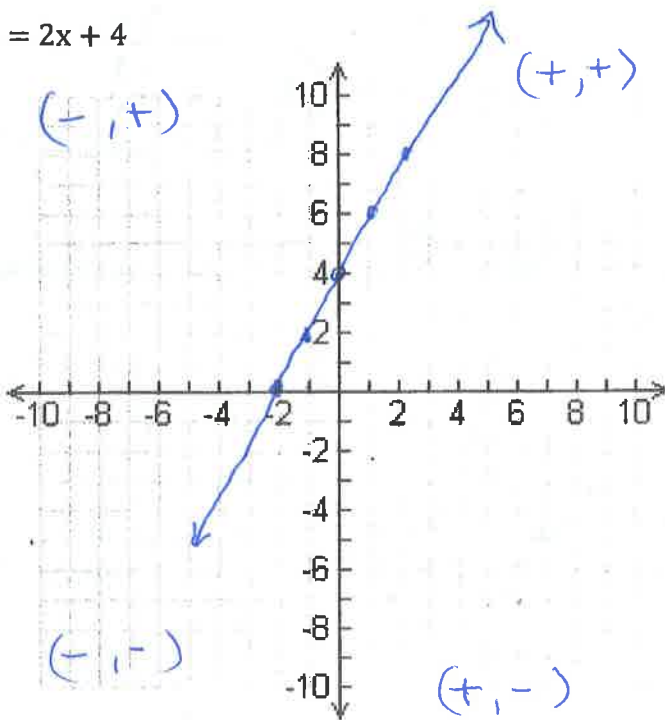
x	-3	-2	-1	0	1	2	3
f(x)	0	1	2	3	4	5	6

- a. 1
- b. 0
- c. -2
- d. 4

Linear Characteristics

4. Graph the function and determine the key characteristics.

$f(x) = 2x + 4$



Domain: $-\infty, +\infty$

Range: $-\infty, +\infty$

x-intercept: $(-2, 0)$

y-intercept: $(0, 4)$

Increasing or Decreasing?

Where?

End Behavior:

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

As $x \rightarrow \infty, y \rightarrow +\infty$

Use the graph below to answer questions 5 - 8

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

when $y = 5, x = 3$ so, $(3, 5)$

6. What is the domain of the function?

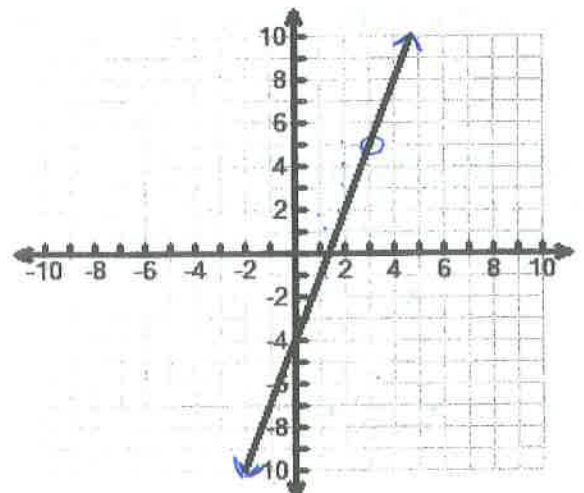
put arrows on graph

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

$x \rightarrow +\infty; y \rightarrow +\infty$

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

$y = 3x - 4$



Rate of Change

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

$$\frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-9 - 1}{15 - 10} = \frac{-10}{5} = -2$$

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

$$\begin{aligned} 3x - 6y &= 12 \\ -6y &= -3x + 12 \\ y &= \frac{1}{2}x - 2 \end{aligned}$$

$m = \frac{1}{2}$

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

$$\text{Roc} = \frac{\Delta y}{\Delta x}$$

$$\text{Roc} = \frac{-2}{1}$$

$$\text{Roc} = \frac{\Delta y}{\Delta x}$$

$$\text{Roc} = \frac{-1}{1} = -1$$

$$\Delta x = 1 \quad \Delta y = -2$$

$$\Delta x = 1 \quad \Delta y = -1$$

Which of the linear functions below has a slope **greater than** the slope for Function 1 but **less than** the slope for Function 2?

$$-2 < \text{Roc} < -1$$

a. $f(x) = -1.5x - 2$

$$\text{Roc} = -1.5$$

b. $f(x) = -2x - 4$

$$\text{Roc} = -2$$

c. $f(x) = -2.5x + 3$

$$\text{Roc} = -2.5$$

d. $f(x) = -3x + 6$

$$\text{Roc} = -3$$

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.

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

$$a_n = 5(n-1) + 2$$

$$a_n = 5n - 5 + 2 \Rightarrow a_n = 5n - 3$$

$$d = 5$$

$$a_1 = 2$$

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.

Term	value
$a_1 \rightarrow$	27 -3
$a_2 \rightarrow$	24
$a_3 \rightarrow$	21 -3

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

a. Write a function to model this situation.

$$y = 6x + 4$$

$x = \# \text{ pizzas bought}$

$y = \text{cost}$

b. Complete the table.

n	a_n
0	4
1	10
2	16
3	22
4	28

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

$$y = 6(25) + 4$$

$$y = 210 + 4$$

$$y = \$214$$

$$d=6 \quad a_1=5$$

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

$$a_{15} = 2(15) + 5$$

$$a_{15} = 30 + 5$$

$$a_{15} = 35$$

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

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

$$a_n = 6(n-1) + 5$$

$$a_n = 6n - 6 + 5$$

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

$$a_{30} = 2(30) - 12$$

$$a_{30} = 60 - 12$$

$$a_{30} = 48$$

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

$$6n-1$$

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

neither

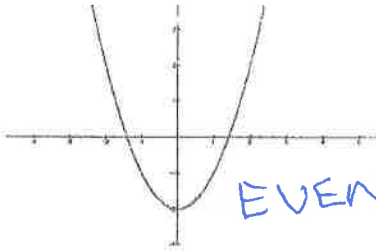
17. $f(x) = 2x^5 + x$

ODD

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

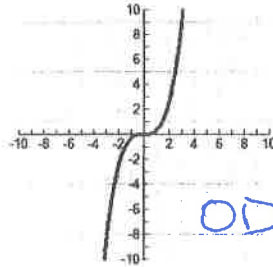
EVEN

19.



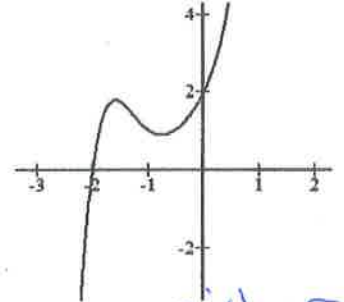
EVEN

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.

$$y = 14x + 5$$

$m = 14$ (made per hour)

$b = 5$ (cost of gas)

23. For the following table:

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

$$\Delta x = +1$$

$$\Delta y = -3$$

a) Is the relation a function?

yes

c) What is the range?

Range: $\{10, 7, 4, -2, -5, -8\}$

b) What is the domain?

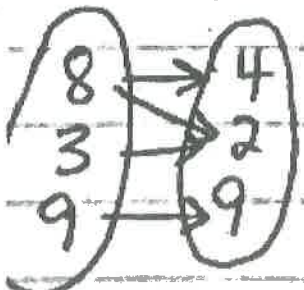
Dom: $\{1, 2, 3, 4, 5, 6\}$

d) What is the rate of change?

$$\frac{\Delta y}{\Delta x} = \text{ROC} = \frac{-3}{+1} = -3$$

26. Determine if the following are functions:

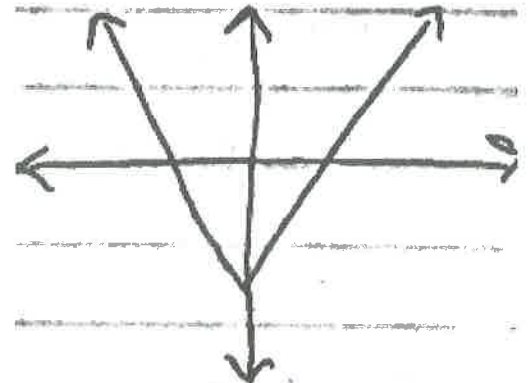
a)



NOT function

$8 \rightarrow 4$
 $3 \rightarrow 2$; not 1 to 1 relation

b)



function

passes vertical line test