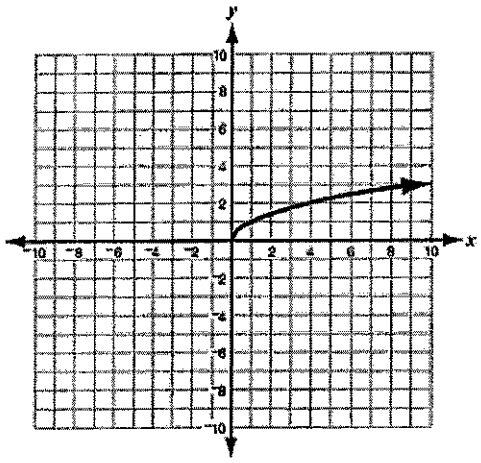
Name SINGLETON Date _____ Block ____

Unit 2 Study Guide (Semester Math 1)

1.) The graph of a function is shown below. Which inequality represents the domain of the function?



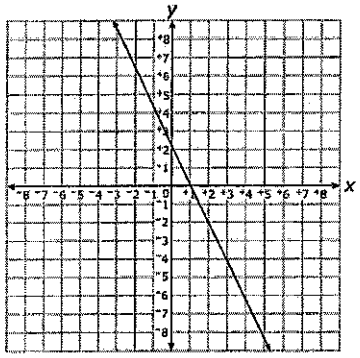
A) $y \geq 0$ B) $x \geq 3$

C) $y \geq 3$ D) $x \geq 0$

↓ X-values

2). A function has a slope of -1 and a y-intercept of 1. Which is the graph of this function?

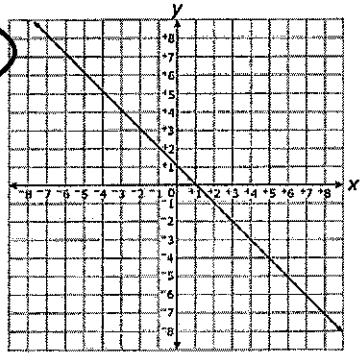
A.



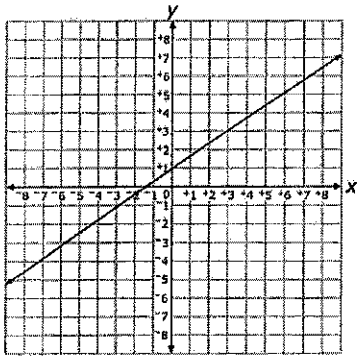
$m = -1$

$b = 1$

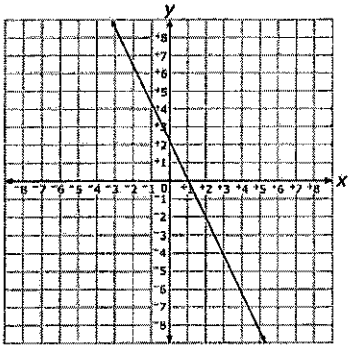
C.



B.



D.



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Unit 2 Study Guide (Semester Math 1)

3.) In which table is y a function of x?

A. (-1, 5), (2, 6), (0, 3), (-1, -2)

B. (2, 6), (2, -1), (1, 2), (0, 0)

C. (3, -1), (-2, 4), (3, 0), (2, 4)

D. (0,6), (2, 2), (-1, 8), (4, -2)

No repeating x-values

4.) The table below shows the cost to rent a movie for different numbers of days at a movie rental store.

Days	Total Cost
3	$3.50
5	$7.50
6	$9.50
9	$15.50

(5, 7.50)
(9, 15.50)

What is the average cost per day from 5 days to 9 days?

$\frac{15.50-7.50}{9-5}=\frac{8}{4}=2$ $2.00 per day

5.) The graph of a linear function passes through the points (4,5) and (6,11).

Which is an equation of the function?

① $\frac{11-5}{6-4}=\frac{6}{2}=3$

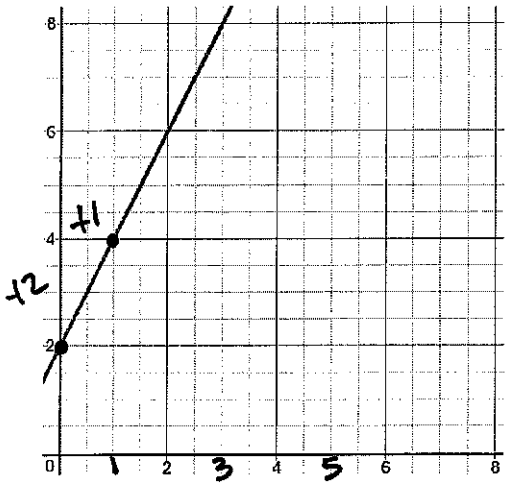
② $y-5=3(x-4)$

$y-5=3x-12$

$+5 \quad +5$

$y=3x-7$

6.) Which choice is a correct equation for the graph shown below?



A) y = 2x + 4

B) y = 4x + 2

C) y = 6x + 2

D) y = 2x + 2

m = 2
b = 2

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

7.) What is the approximate average rate of change for f(x)= -10x + 8 for the interval $-15 \le x \le 2$?

f(-15) = -10(-15)+8 = 158

f(2) = -10(2)+8 = -12

(-15, 158)
(2, -12)

$\frac{-12-158}{2+15}=\frac{-170}{17}=-10$

-10

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Unit 2 Study Guide (Semester Math 1)

8.) The function $f(x)= 4x + 12$ models the yearly membership cost for a movie rental club, where x is the number of movies rented.

- Last year, Sarah rented 24 movies. $4(24)+12 = 96+12 = 108$
- Last year, Tim rented twice the amount of movies as Sarah. 48 $4(48)+12=192+12=204$

How much more did Tim pay last year than Sarah?

A) \$24 B) \$108

C) \$96 D) \$204

$204-108$

96

9.) Pat is a real estate agent. She earns a weekly amount of \$150 in addition to 4% of her weekly sales.

4% → 0.04

A. Write a linear equation in slope-intercept form to find the total amount she earned this week.

x = weekly sales $y = 0.04x+150$

B. What does she earn if she sold a house for \$325,000 this week?

$y=0.04(325,000)+150$

$y= 13150$

\$13,150

10.) The function $W(x)= 0.14x + 5.10$ models the cost to ship a package at Speedy Ship based on weight in pounds x. The table below shows the cost to ship a package at another company, Express Send.

Number of pounds (x)	Total cost in dollars ($f(x)$)
0	5.25
5	5.90
10	6.55
15	7.20
20	7.85

5 → .65

5 → .65

5 → .65

5 → .65

Compare the cost per pound and flat fee for both companies.

Speedy Ship

$m = 0.14$

$b = 5.10$

Express Send

$m = 0.13$

$b = 5.25$

Larger rate of change: Speedy Ship

Larger y-intercept: Express Send

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Unit 2 Study Guide (Semester Math 1)

11.) For f(x) = 2x – 6 what is the value of x = -3?

$2(-3)-6$

$-6-6=-12$

$f(-3)=-12$

12.) What is the value of $f(4)$ for the function $f(x)=\frac{1}{3}x-4$

$\frac{1}{3}(4)-4$

$\frac{4}{3}-4=-\frac{8}{3}$

A. $\frac{-10}{3}$

C. $\frac{-8}{3}$

B. $\frac{-14}{3}$

D. $\frac{22}{3}$

13.) A soccer camp charges $120 per camper for 12 campers. When a team brings 18 campers, the rate is reduced to $100 per camper. What is the rate of change in cost per camper?

(12, 120)

(18, 100)

$\frac{100-120}{18-12}=\frac{-20}{6}=-3.\overline{3}$

A. $3.33 B. $12.00 C. $5.55 D. $20.00

Slope

14.) Debra runs at a constant rate of speed. At the end of 15 minutes, she has run 2 miles. At the end of 45 minutes, she has run 6 miles. What is the equation that represents the number of miles she runs, n, in terms of the time she has run, t minutes?

(15, 2)

(45, 6)

$\frac{6-2}{45-15}=\frac{4}{30}=.1\overline{3}$

A. $n = 1.3t$ B. $n = 1.7t$ C. $n = .13t$ D. $n = .17t$

15.) In which function is the population, y, increasing by 65 each month, x?

Slope of 65

A. $y = 65x + 100$

B. $y = -65x + 100$

C. $y = 100x + 65$

D. $y = \frac{1}{65x}$

16.) The function k(x)= 35.75x + 40 models the total cost for a cleaning company to clean a house, where x is the number of hours it takes to clean the house. What is the average rate of change of the function between 2 hours and 6 hours?

$K(2)=35.75(2)+40=111.50$

$K(6)=35.75(6)+40=254.50$

(2, 111.50)

(6, 254.50)

$\frac{254.50-111.50}{6-2}=\frac{143}{4}$

$35.75 per hr.

17.) A 4-pound bag of popcorn costs $7.00 and a 9-pound bag of popcorn costs $15.75. Assuming the cost of popcorn follows a linear trend, how much would a 3-pound bag of popcorn cost?

(4, 7)

(9, 15.75)

$\frac{15.75-7}{9-4}=\frac{8.75}{5}=\$1.75$ per pound

$1.75(3)=\$5.25$

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Unit 2 Study Guide (Semester Math 1)

18.) Which table of values represents a linear function?

A.

x	f(x)	
-6	12	-2
-5	10	-2.75
-4	7.25	-1.7955
-3	5.4545	

C.

x	f(x)	
3	14	1
4	15	-2
5	13	1
6	14	

B.

x	f(x)	
5	8	15
8	23	5
9	28	10
11	38	

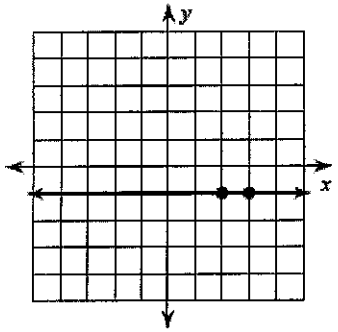
$\frac{15}{3}$ $\frac{5}{1}$ $\frac{10}{2}$

All simplify to 5

D.

x	f(x)	
-3	2.75	1.50
-2	4.25	1.75
-1	6	1.25
0	7.25	

19.) What is the equation of the line graphed below?



Horizontal lines have zero as their slope

$y = -1$

20.) Ashtyn is saving the same amount of money each week from babysitting. After 3 weeks, she saves $105. After 5 weeks, she saves $165. What equation models the amount of money Ashtyn will have saved, y, after x weeks?

(3, 105)
(5, 165)

① $\frac{165-105}{5-3} = \frac{60}{2} = 30$

② $y - 105 = 30(x-3)$

$y - 105 = 30x - 90$

$+105 \quad +105$

$y = 30x + 15$

21.) Given a slope of 3 and the point (10, 51), write the equation written in slope intercept form.

$y - 51 = 3(x-10)$

$y - 51 = 3x - 30$

$+51 \quad +51$

$y = 3x + 21$

22.) Write the equation of a line with a slope of 4 and passes through the point (0, 9)

$y = 4x + 9$

↑ when x is zero the y is the y-intercept

23.) Rewrite the following equation in slope intercept form: $x - 2y = 10$

$x - 2y = 10$

$-x \quad -x$

$-2y = -x + 10$

$\frac{-2y}{-2} = \frac{-x}{-2} + \frac{10}{-2}$

$y = \frac{1}{2}x - 5$

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Unit 2 Study Guide (Semester Math 1)

24.) An ordered pair is missing from the table below:

x	f(x)
0	14
1	11
2	6
?	?

Which ordered pair would **prevent** the relation in the table from being a function?

A. (-1, 14) B. (0, 16) C. (3, 5) D. (4, 6)

25.) Given the table below is a linear function, what is the equation in slope intercept form?

x	f(x)
-2	0
0	10
2	20
4	30

A) $y = 5x + 10$ B) $y = 5x - 2$

C) $y = 2x + 5$ D) $y = 2x + 10$

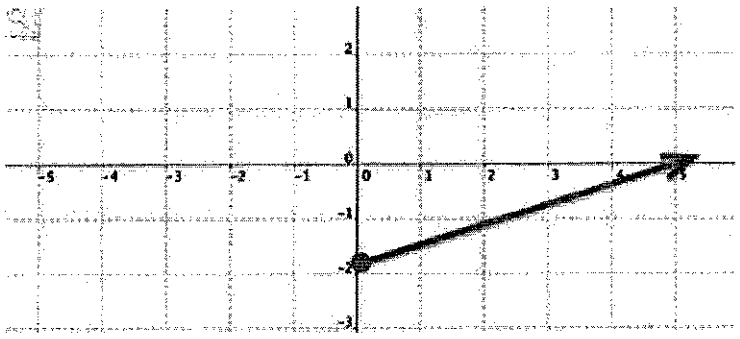
$m = \frac{10}{2} = 5$

26.) Evaluate $f(x) = x^2 - x$, for f(-5)

$(-5)^2 - (-5) = 25 + 5 = 30$

27.) The range of the function represented by this graph is best expressed by which of the following?

range → y-values



A. $x \geq 0$
B. $x \geq -2$
C. $y \geq 0$
D. $y \geq -2$

28.) A sequence is described by a certain function g(x). The first 5 terms of the sequence are shown.

x	1	2	3	4	5
g(x)	-2	1	4	7	10

$a_1 = -2$

$d = 3$

What is the explicit formula for g(x)?

$a_n = 3(n-1) - 2$

$a_n = 3n - 3 - 2$

$a_n = 3n - 5$

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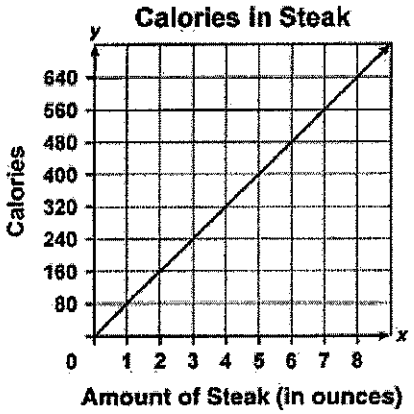
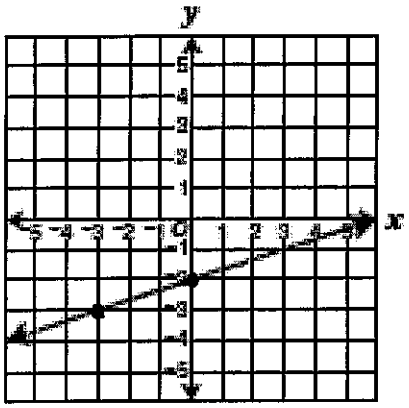
Unit 2 Study Guide (Semester Math 1)

29.) The line in the graph below shows the relationship between the number of calories in different amounts of steak. Which equation best represents this relationship?



A. $y = -80x$
B. $y = 2x + 80$
C. $y = 80x$
D. $y = x$

$m = 80$
$b = 0$



30.) What is an equation of the line graphed below?

$m = \frac{1}{3}$
$b = -2$

$y = \frac{1}{3}x - 2$

31. Alec earns income through a weekly salary and tips. His average weekly income can be approximated by the function $h(x) = 8x + 375$, where x is the number of customers she serves per week. Which statement is true?

A. Alec earns an average of $8.00 in tips per customer she serves and is paid a weekly salary of $375
B. Alec serves an average of 8 customers per week and is paid a weekly salary of $375
C. Alec serves an average of 8 customers per week and earns $375 in tips each week.
D. Alec earns an average of $8.00 per week and earns $375 in tips each week.

32. The following sequence is defined by the function $a_n = d(n-1) + a_1$ where d represents the common difference and a_1 represents the first term in the sequence: 13, 9, 5, 1…

A. Write the rule for the n^{th} term
B. Find a_{12}

$a_1 = 13$
$d = -4$

$a_n = -4(n-1)+13$
$a_n = -4n+4+13$

A. $a_n = -4n+17$

B. $a_{12} = -4(12)+17$
$= -48+17$
$= -31$