Name Key

Algebra 1 Midterm Review 2018 6

1. Fred is given a rectangular piece of paper. If the length of Fred's piece of paper is represented by $2x - 6$ and the width is represented by $3x - 5$, then the paper has a total area represented by

(1) $5x = 11$
(2) $6x^2 - 28x + 30$
(3) $10x - 22$
(4) $6x^2 - 6x - 11$

$A = l \cdot w$

$A = (2x-6)(3x-5)$

	$2x$	-6
$3x$	$6x^2$	
-5		

$y_1 = (2x-6)(3x-5)$
$y_2 =$ choices table feature

2. What is the product of $3x - 2$ from $3x^2 + 8x - 7$. Express the result as a trinomial.

mult

	$3x^2$	$+8x$	-7
$3x$	$9x^3$	$+24x^2$	$-21x$
-2	$-6x^2$	$-16x$	$+14$

standard form

$9x^3 + 18x^2 - 37x + 14$

Lead coeff = 9
constant = 14

3. Walton has his money invested in a stock portfolio. The value, $w(x)$, of his portfolio can be modeled with the function $w(x) = 15{,}260(.88)^x$, where x is the number of years since he made his investment. Which statement describes the rate of change of the value of his portfolio?

$y = a(1+r)^t$

$1 - r = .88$

$.88 < 1.00$

1) It decreases 88% per year.
decrease less than $1.00

3) It increases 88% per year.
increase more than $1.00

2) It decreases 12% per year.
$(1 - .12)$
$(.88)$

4) It increases 12% per year.

4 The expression $2(x^2 + 1) - 1(x^2 + 6x - 9)$ is equivalent to

distribute
combine like terms

$2x^2 + 2 - 1x^2 - 6x + 9$

$1x^2 - 6x + 11$

$4x^2 - 4x^3$
Leadcoeff
-4

$-4 \times 3 \quad 4 \vee 2$

$y_1 = (3x^2+5x-6) - (-2x^2-6x+7)$ (A) (B)

y_2 = choices

5. If $A = (3x^2 + 5x - 6)$ and $B = (-2x^2 - 6x + 7)$, then $A - B$ equals

(1) $-5x^2 - 11x + 13$
(2) $5x^2 + 11x - 13$
(3) $-5x^2 - x + 1$
(4) $5x^2 - x + 1$

6. Which expression is equivalent to $(3x^5 + 8x^3) - (7x^2 - 6x^3)$?

(1) $-4x^3 + 14$
(2) $-4x^5 + 14x^3$
(3) $3x^5 + 14x^3 - 7x^2$
(4) $3x^5 + 2x^3 - 7x^2$

$y_1 =$ (3x^5 ect problem)
$y_2 =$ ~~ect~~ choices
look at table for $y_1 = y_2$

x	y_1	y_2
	0	0
	5	5
	8	8

7. Which expression is equivalent to the expression shown?

$-3a(a + b - 5) + 4(-2a + 2b) + b(a + 3b - 7)$

(1) $11a^2 + 3b^2 - 2ab + 7a + b$
(2) $-11a^2 + 3b^2 - 4ab + 7a + b$
(3) $-3a^2 + 3b^2 - 2ab + 7a + b$
(4) $-3a^2 + 3b^2 - 4ab + 7a + b$

$-3a^2 - 3ab + 15a - 8a + 8b + 4ab + 3b^2 - 7b$

Ans $-3a^2 + 3b^2 - 2ab$ change # 3

8. Simplify each expression.

Add

A. $(a^2 - 3a) + (3a^2 + 4a)$

$2a^2 - 1a$

B. $(2x^3y^2)(-4x^4y)$ multiply add exp

$-8x^7y^3$

C. $-2(x + 5) - 7(x - 2)$

$-2x - 10 - 7x + 14$

$-9x + 4$

D. $(c + 2)(c^2 - 2c + 5)$ make box

	c^2	$-2c$	$+5$
c	c^3	$-2c^2$	$+5c$
$+2$	$2c^2$	$-4c$	$+10$

9. ~~Express the area of the rectangle as a trinomial~~: put in standard form

$1c^3 + 1c + 10$

Lead coeff = 1

constant = 10

10. Connor wants to attend the town carnival. The price of admission to the carnival is $4.50, and each ride costs an additional 79 cents. If he can spend at most $16.00 at the carnival, which inequality can be used to solve for r, the number of rides Connor can go on, and what is the maximum number of rides he can go on?

(1) $0.79 + 4.50r \leq 16.00$; 3 rides
(2) $0.79 + 4.50r \leq 16.00$; 4 rides
(3) $4.50 + 0.79r \leq 16.00$; 14 rides
(4) $4.50 + 0.79r \leq 16.00$; 15 rides

≤ 16

$4.50 + .79r \leq 16$

$.79r \| 11.50$

$.79 \quad .79$

$r \leq 14.55$

14 14.5 15

14

11. The formula for the volume of a right circular cylinder is $V = \pi r^2 h$. The value of h can be expressed as

1) $\frac{V}{\pi r^2}$
2) $\frac{V}{\pi r^2}$
3) $\frac{\pi r^2}{V}$
4) $V - \pi r^2$

must know how to solve for a variable

$\frac{\pi r^2 h}{\pi r^2} = \frac{V}{\pi r^2}$

undo

12. In the equation $A = p + prt$, t is equivalent to

1) $\frac{A - pr}{p}$
2) $\frac{A - p}{pr}$
3) $\frac{A}{pr} - p$
4) $\frac{A}{p} - pr$

$7 + 31t = 50$

$p + prt = A$

$-p \qquad -p$

$\frac{A - p}{pr}$

$\frac{prt}{pr} = \frac{A - p}{pr}$

13. Jordan works for a landscape company during his summer vacation. He is paid $12 per hour for mowing lawns and $14 per hour for planting gardens. He can work a maximum of 40 hours per week, and would like to earn at least $250 this week. If m represents the number of hours mowing lawns and g represents the number of hours planting gardens, which system of inequalities could be used to represent the given conditions?

1) $m + g \leq 40$
$12m + 14g \geq 250$

2) $m + g \geq 40$
$12m + 14g \leq 250$

3) $m + g \leq 40$
$12m + 14g \leq 250$

4) $m + g \geq 40$
$12m + 14g \geq 250$

at least
≥ 250

max of 40
≤ 40

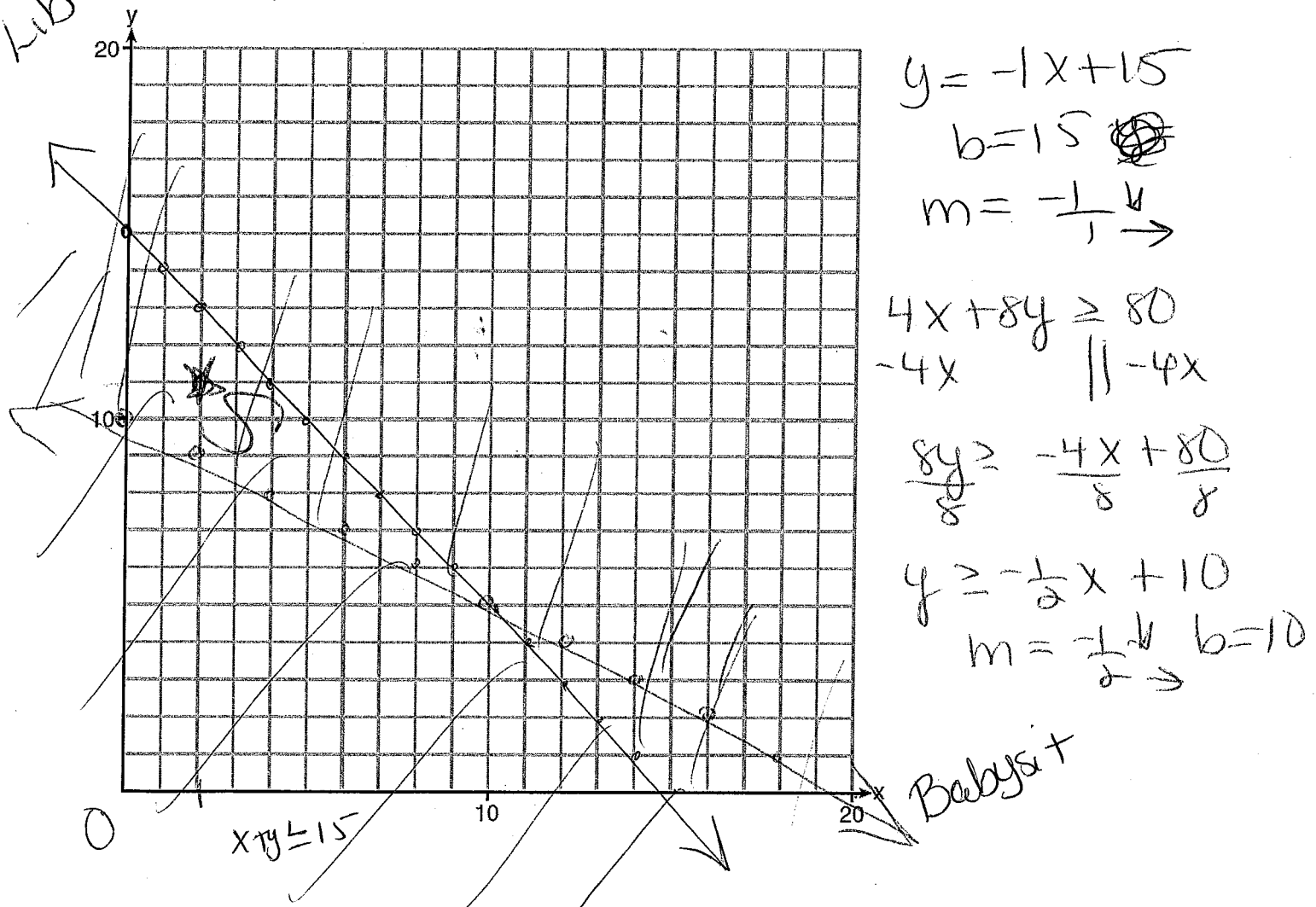
14. Edith babysits for x hours a week after school at a job that pays \$4 an hour. She has accepted a job that pays \$8 an hour as a library assistant working y hours a week. She will work both jobs. She is able to work *no more than* 15 hours a week, due to school commitments. Edith wants to earn *at least* \$80 a week, working a combination of both jobs. Write a system of inequalities that can be used to represent the situation.

$x + y \leq 15$

$4x + 8y \geq 80$

put in y= form

Graph these inequalities on the set of axes below.



Lib

$y = -1x + 15$

$b = 15$

$m = \frac{-1}{1}$ ↓ →

$4x + 8y \geq 80$

$-4x \quad || \quad -4x$

$\frac{8y}{8} \geq \frac{-4x}{8} + \frac{80}{8}$

$y \geq -\frac{1}{2}x + 10$

$m = \frac{-1}{2}$ ↓ → $b = 10$

Determine and state one combination of hours that will allow Edith to earn *at least* \$80 per week while working *no more than* 15 hours.

$x = 2$ 2 babsi thaks

$y = 11$ 11 Lib haks

something in solution set

15. When solving the equation $4(3x^2 + 2) - 9 = 8x^2 + 7$, Emily wrote $4(3x^2 + 2) = 8x^2 + 16$ as her first step. Which property justifies Emily's first step?

(1) addition property of equality
(2) commutative property of addition
(3) multiplication property of equality
(4) distributive property of multiplication over addition

16. What is the value of x in the equation $\frac{x-2}{3} + \frac{1}{6} = \frac{5}{6}$?

(1) 4
(2) 6
(3) 8
(4) 11

$y_1 = y_2$ at what value of "x"
use table and look at x values

17. Which value would be a solution for x in the inequality $47 - 4x < 7$?

Use this space for computations.

1) -13
2) -10
3) 10
4) 11

$y_1 < y_2$

X	y_1	y_2
-13	99	7
-10	87	7
10	7	7
11	3	7

18. Solve: $-5n + 16 \leq -7n$.

(1) $n \leq -8$
(2) $n \leq 8$
(3) $n \geq -8$
(4) $n \geq 8$

Longway

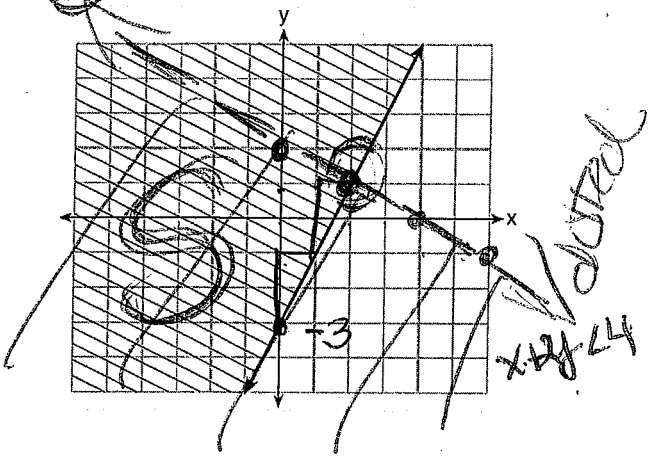
$-5n + 16 \leq -7n$
$+7n \quad\quad +7n$
$2n + 16 \leq 0$
$-16 \quad -16$
$\frac{2n}{2} \leq \frac{-16}{2}$
$n \leq -8$

19. Solve the inequality below to determine and state the smallest possible value for x in the solution set.

$3(x + 3) \leq 5x - 3$

$3x + 9 \leq 5x - 3$
$-5x \quad\quad -5x$
$-2x + 9 \leq -3$
$-9 \quad\quad -9$
$-2x \leq -12$
$x \geq 6$ smallest value {6}

20. The graph of an inequality is shown below.



a) Write the inequality represented by the graph.

$y = mx + b \quad y \geq \frac{2}{1}x - 3$ run

b) On the same set of axes, graph the inequality $x + 2y < 4$.

$y = mx + b$

$1x + 2y < 4$

$-1x \quad\quad -1x$

$2y < -1x + 4$

$\frac{2y}{2} < \frac{-1x}{2} + \frac{4}{2}$

$y < -\frac{1}{2}x + 2$

$m = -\frac{1}{2}$ ↓ 2 → $b = 2$

dotted, shade down

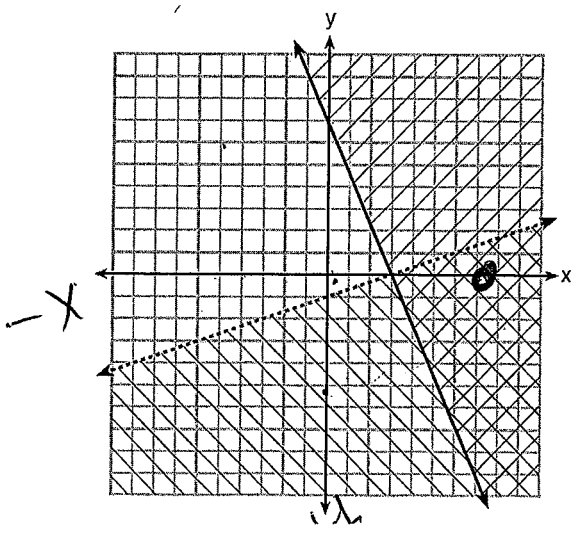
c) The two inequalities graphed on the set of axes form a system.
Oscar thinks that the point (2,1) is in the solution set for this system of inequalities.
Determine and state whether you agree with Oscar. Explain your reasoning.

NO, b/c the point is on a solid (=) and dotted (≠)

21. The graph of a linear equation contains the points (3,11) and (−2,1). Which point also lies on the graph?

(1) (2,1)
(2) (2,4)
(3) (2,6)
(4) (2,9)

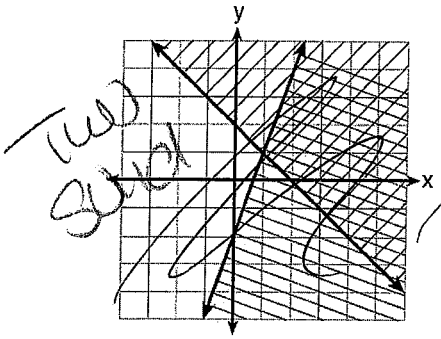
22. What is one point that lies in the solution set of the system of inequalities graphed below?



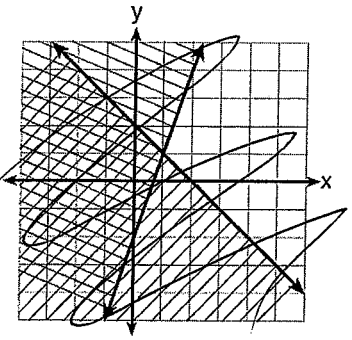
(1) (7,0)
(2) (3,0)
(3) (0,7)
(4) (−3,5)

23. Given: $y + x > 2$
$y \leq 3x - 2$

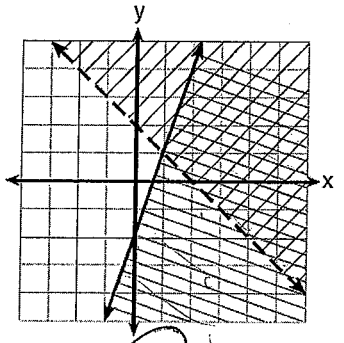
Which graph shows the solution of the given set of inequalities?



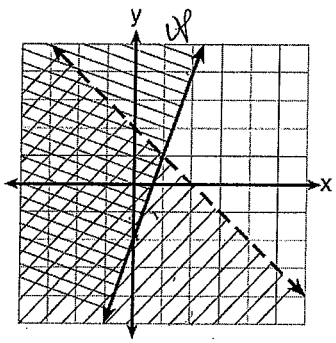
(1)



(3)

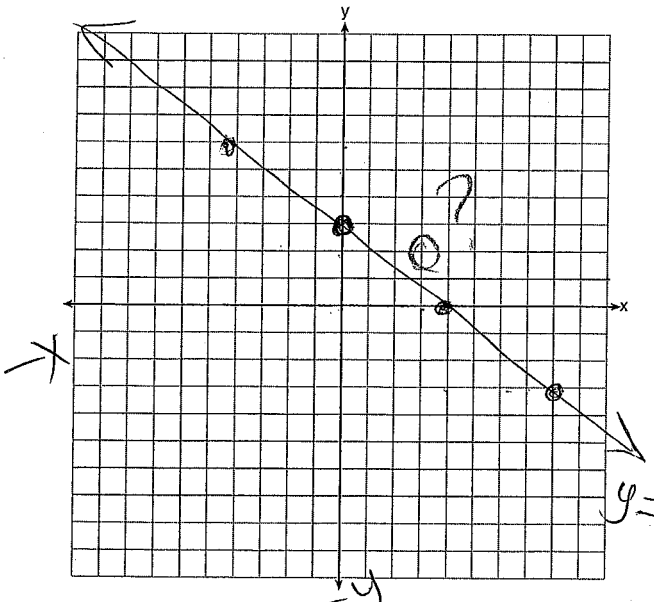


(2)



(4)

24. On the set of axes below, draw the graph of the equation $y = -\frac{3}{4}x + 3$.



Is the point (3,2) a solution to the equation? Explain your answer based on the graph drawn.

y = mx + b y-int (x, y) (x, f(x))

25. Which function has the greatest *y*-intercept?

1) $f(x) = 4x + 0$ y = mx + b b = 0 (b = 0)

2) $\frac{2x}{2} + \frac{4y}{2} = \frac{8}{2}$ (b = 2)

$1x + 2y = 4$

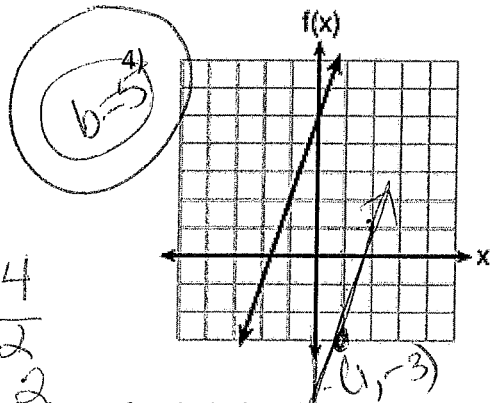
$-1x \quad\quad -1x$

$\frac{2y}{2} = \frac{-1x}{2} + \frac{4}{2}$

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

3) the line that has a slope of 4 and passes through (1,-3) b = neg # $m = \frac{4}{1}$ (1, -3)

4)



(b = -5)

26. A function is shown in the table below. If included in the table, which ordered pair, (−4,1) or (1,−4), would result in a relation that is no longer a function? Explain your answer.

x	f(x)
−4	2
−1	−4
0	−2
3	16

x, y

Def function: VLT if picture "x" domain can't repeat

(-4,1) b/c domain repeats

27. The function *f* has a domain of {1,3,5,7} and a range of {2,4,6}. Could *f* be represented by {(1,2),(3,4),(5,6),(7,2)}? Justify your answer.

yes b/c domain does not repeat

28. Which situation could be modeled by using a linear function?

y = mx + b linear: increases or decreases by same number (slope) common difference rate of change

(1) a bank account balance that grows at a rate of 5% per year, compounded annually

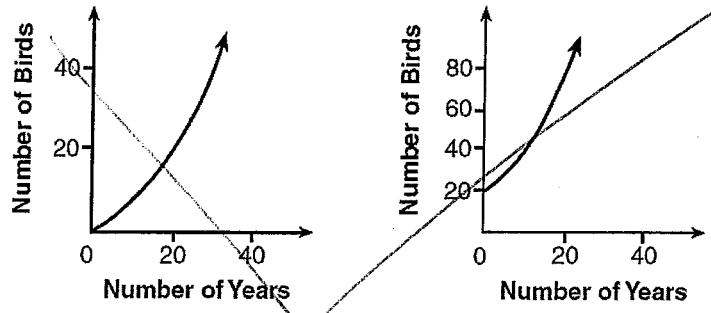
(2) a population of bacteria that doubles every 4.5 hours

(3) the cost of cell phone service that charges a base amount plus 20 cents per minute

(4) the concentration of medicine in a person's body that decays by a factor of one-third every hour

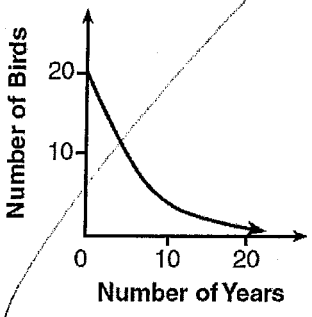
$y = a(1 \pm r)^t$ (1) when you multiply (2) (commonly) exponential

29. A population that initially has 20 birds approximately doubles every 10 years. Which graph represents this population growth?

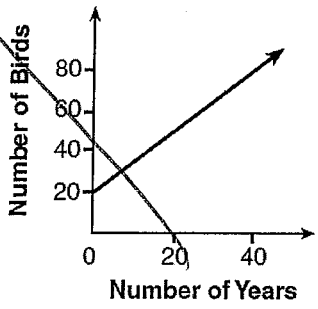


(1)

(3)



(2)



(4)

30. Which table of values represents a linear relationship?

x	f(x)
-1	-3
0	-2
1	1
2	6
3	13

(1)

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

(3)

increases by 2

x	f(x)
-1	$\frac{1}{2}$
0	1
1	2
2	4
3	8

(2)

x	f(x)
-1	-1
0	0
1	1
2	8
3	27

(4)

31. Which chart could represent the function f(x) = 2x + 6

put in y= and look at table

1)

x	f(x)
0	6
2	10
4	14
6	18

3)

x	f(x)
0	8
2	10
4	12
6	14

2)

x	f(x)
0	4
2	6
4	8
6	10

4)

x	f(x)
0	6
2	2
4	−2
6	−6

32. In a sequence, the first term is 4 and the common difference is 3. The fifth term of this sequence is

1) −11
2) −8
3) 16
4) 19

4 (1st) 7 (2nd) 10 (3rd) 13 (4th) 16 (5th)

add common diff

33. A company that manufactures radios first pays a start-up cost, and then spends a certain amount of money to manufacture each radio. If the cost of manufacturing *r* radios is given by the function $c(r) = 5.25r + 125$, then the value 5.25 best represents

(1) the start-up cost 125
(2) the profit earned from the sale of one radio
(3) the amount spent to manufacture each radio
(4) the average number of radios manufactured

y = mx + b start point

$c(r) = 5.25r + 125$

rate of change

initial value

34. If $f(n) = (n-1)^2 + 3n$, which statement is true?

1) $f(4) = -13$
2) $f(2) = 5$
3) $f(-2) = 7$
4) $f(8) = 24$

no answer here! mistake

If n = 4 what is the answer

$f(4) = (4-1)^2 + 3(4) = 21$

$y = a(1 \pm r)^t$ Have to memorize

35. Krystal was given $3000 and her parents invested it at a 2% interest rate compounded annually. No deposits or withdrawals were made. Which statement does not yield the correct balance in the account at the end of 3 years.

(1) ~~$3000(1.02)^3$~~
(2) ~~$3000(1 - 0.02)^3$~~
(3) $3000(1 + 0.02)(1 + 0.02)(1 + 0.02)$
(4) $3000 + 3000(.02) + 3060(.02) + 3121.2(.04)$

$a = 3000$ $t = 3$
$r = 2\% = .02$
$3000(1+.02)^3$
$3000(1.02)^3$

36. Rhonda deposited $3000 in an account in the Merrick National Bank, earning 4.2% interest, compounded annually. She made no deposits or withdrawals. Write an equation that can be used to find *B*, her account balance after *t* years.

$y = a(1+r)^t$ money increases in a bank

$3000(1+.042)^t$
$300(1.042)^t$

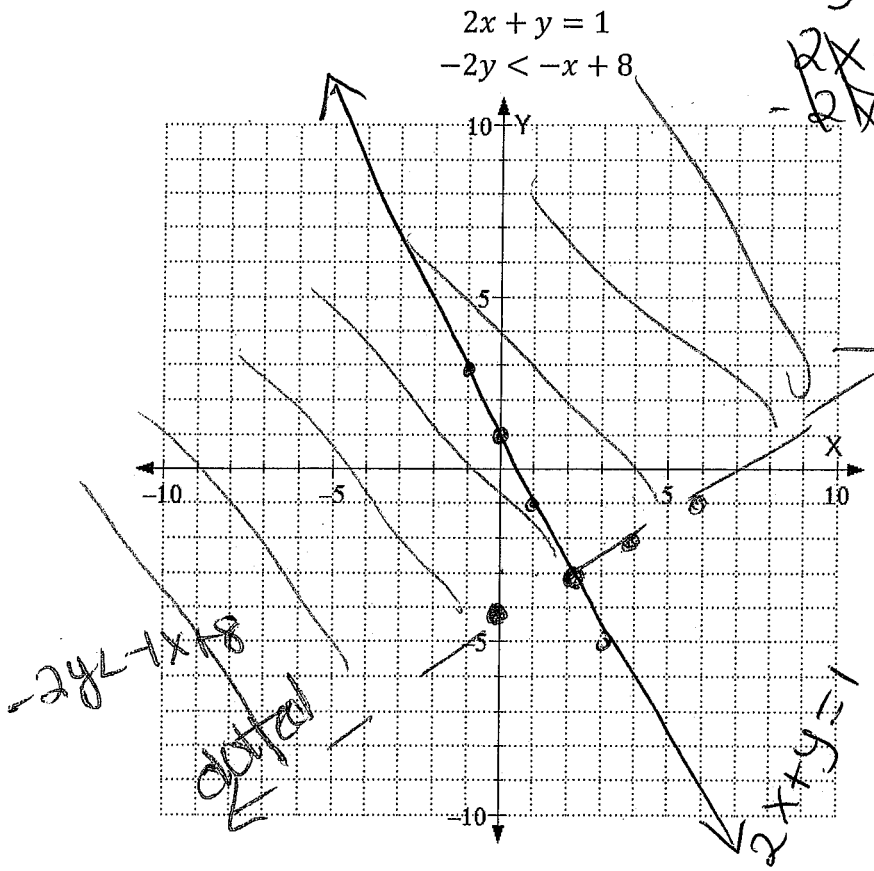
37. Solve the following system of equations graphically on the grid below.

slope s+pt
$y = mx+b$

$2x+y=1$
$-2x \quad -2x$
$y = -2x+1$
$m = \frac{-2}{1}$ $b=1$

$-2y < -1x+8$
$\frac{-2y}{-2} < \frac{-1x+8}{-2} \quad \frac{}{-2}$
$y > \frac{1}{2}x - 4$
$m = \frac{1}{2}$ $b=-4$

$2x + y = 1$
$-2y < -x + 8$



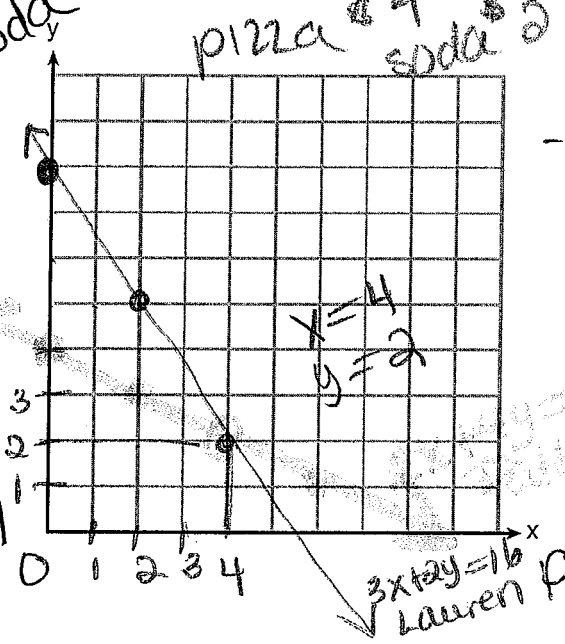
$-2y < -1x+8$ dotted

38. Lauren and Patty went to the pizzeria to buy pizza and drinks. Lauren bought 3 pieces of pizza and 2 drinks for $16. Patty bought 2 pieces of pizza and 4 drinks for $16. Let x equal the price of piece of pizza and y equal the price of one drink.

Write a system of equations that describes the given situation. $3x+2y=16$
$2x+4y=16$

On the set of axes below, graph the system of equations.

Patty
$y=mx+b$
$2x+4y=16$
$-2x \quad -2x$
$\frac{4y}{4}=\frac{-2x}{4}+\frac{16}{4}$
$y=-\frac{2}{4}x+4$
$m=-\frac{1}{2}$ $b=4$



Lauren
$y=mx+b$
$3x+2y=16$
$-3x \quad -3x$
$\frac{2y}{2}=\frac{-3x}{2}+\frac{16}{2}$
$y=-\frac{3}{2}x+8$
$m=-\frac{3}{2}$ $b=8$

Determine the exact cost of one piece of pizza and the exact cost of one drink in dollars and cents. Justify your solution.

Half credit $2(3x+2y=16)$
$-3(2x+4y=16)$

$6x+4y=32$
$-6x-12y=-48$
$-8y=-16$
$\frac{-8y}{-8}=\frac{-16}{-8}$
$y=+2.00$

Plug $y=2$ into original
$3x+2y=16$
$3x+2(2)=16$
$3x+4=16$
$-4 \quad -4$
$\frac{3x}{3}=\frac{12}{3}$
$x=\$4.00$

pizza $4
drink $2