Fall Final Review

REVIEW IS REQUIRED EVEN IF EXEMPTING!!! (It will be worth a HW grade.)

Show ALL work on separate piece of paper. Review is due on the day of the final exam.

Calculator should be used ONLY on #1 - 11.

- 1. Tasty Bakery sells three kinds of muffins: chocolate chip muffins for \$0.65 each, oatmeal muffins for \$0.70 each, and blueberry muffins for \$0.75 cents each. Charles buys some of each kind and chooses three more chocolate chip muffins than blueberry muffins. If he spends \$6.85 on 10 muffins, how many of each type of muffin does he buy? Write a system of three equations in three variables. **DO NOT SOLVE.**
- 2. The table shows the time spent researching the stock market each week and the average weekly percent gain for an investor over one year.

Find a linear model that represents the data. (Use a graphing calculator & linear regression.)

Research (hours)	б	8	10	12	14	16	18
Gain (percent)	2.8	4.4	4.4	4	б	7.2	7.2

- 3. The equation $d = 4.9t^2$, gives the distance, in meters, of an object falling in t seconds. How many seconds would it take for an object to fall 107 meters. *Round to the nearest hundredth*.
- 4. The cost of a field trip is \$150 plus \$11 per student. If the school can spend <u>at most</u> \$700, how many students can go on the field trip?
- 5. The range of a car is the distance R in miles that a car can travel on a full tank of gas. The range varies directly with the capacity of the gas tank C in gallons.
 - **a.** Find the constant of variation for a car whose range is 306 mi with a gas tank that holds 18 gal.
 - **b.** Write an equation to model the relationship between the range and the capacity of the gas tank.
- 6. A balloon takes off from a location that is 21 ft above sea level. It rises 42 ft/min. Write an equation to model the balloon's elevation h as a function of time t.
- 7. Two stores carry small, medium, and large t-shirts. The table shows the inventory at the stores. Display the data in matrix form. Give the dimensions of the matrix.

T-Shirt Inventory							
Small Medium Large							
Store A	10	23	18				
Store B	17	31	26				

8. Leona's Diner offers 8-piece, 12-piece, and 16-piece family chicken meals. The table below lists the costs of three different orders. What is the price of each kind of meal?

8-piece	12-piece	16-piece	Total cost
3	1	1	\$65
2	2	3	\$110
3	3	1	\$95

- 9. A rental car agency charges a flat fee of \$34.00 plus \$2.00 per day to rent a certain car. Another agency charges a fee of \$29.00 plus \$3.25 per day to rent the same car. Write a system of equations to represent the cost c for renting a car at each agency for d days. Then find the number of days for which the costs are the same. Round your answer to the nearest whole day.
- 10. Dalco Manufacturing estimates that its weekly profit, P, in hundreds of dollars, can be approximated by the formula $P = -3x^2 + 6x + 5$, where x is the number of units produced per week, in thousands.
 - **a.** How many units should the company produce per week to earn the maximum profit?
 - **b.** Find the maximum weekly profit.

- 11. In an experiment, a petri dish with a colony of bacteria is exposed to cold temperatures and then warmed again.
 - **a.** Find a quadratic model for the data in the table.

b. Use the model to estimate the population of bacteria at 9 hours.

Time (hours)	0	1	2	3	4	5	6
Population (1000s)	5.1	3.03	1.72	1.17	1.38	2.35	4.08

Evaluate the expression for the given value of the variable(s).

12.
$$|4b - 4| + |3 - b^2| + 2b^3; b = 2$$

Simplify by combining like terms.

14. -3(-4y + 3) + 7ySolve the equation. 15. 3y + 20 = 3 + 2y $16. \ 6(x - 0.8) - 0.2(5x - 4) = 6$ 18. $x^2 + 8x + 16 = 36$ 17. $4x^2 + 9 = 0$ 19. $4x^2 + 9 = 0$ 20. $x^2 + 4x + 4 = 64$ Solve for *x*. State any restrictions on the variables. 21. ax + bx + 9 = 7Solve the inequality. Graph the solution. 22. $|2x-4| \le 6$ 23. $|2x + 2| \ge 22$ 24. Suppose f(x) = 4x - 2 and g(x) = -2x + 1. Find the value of $\frac{f(-2)}{g(3)}$. Find the slope of the line through the pair of points. 25. (6, 12) and (-6, -2)26. (-5, -8) and (4, -4)Find the slope of the line. 28. -2x - 4y = 727. 6x + 2y = -9Find an equation for the line: 30. through (-4, 6) and parallel to y = -3x + 429. through (2, 6) and perpendicular to $y = -\frac{5}{4}x + 1$. Determine whether y varies directly with x. If so, find the constant of variation k. 31. y = 1.2x33. -y = -5x + 332. -6y = -5xSolve the system by the method of substitution.

34. $\begin{cases} -3x - 3y + 2z = -7\\ z = 1\\ -2x - 3y + z = -6 \end{cases}$

Use the elimination method to solve the system.

- 35. $\begin{cases} -4x + 4y = -8 \\ x 4y = -7 \end{cases}$ 36. $\begin{cases} -3x 2y = 3 \\ x 2y = -1 \end{cases}$
- 37. State the dimensions of the matrix. Identify the indicated element.

$$A = \begin{bmatrix} -9 & 4 \\ -7 & 0 \\ -8 & 8 \end{bmatrix}, \alpha_{2,1}$$

Find the sum or difference.

$$38. \begin{bmatrix} -3 & 0 \\ 5 & -7 \end{bmatrix} + \begin{bmatrix} -4 & 2 \\ -1 & 8 \end{bmatrix}$$

Find the values of the variables.

40. $\begin{bmatrix} 3+t & 0\\ 8 & -10 \end{bmatrix} = \begin{bmatrix} -5 & 0\\ 8 & -2y+2 \end{bmatrix}$

Solve the matrix equation.

41.
$$\begin{bmatrix} -1 & -7 \\ 1 & -2 \end{bmatrix} - X = \begin{bmatrix} 1 & 4 \\ -6 & 5 \end{bmatrix}$$

Find the product.

43.
$$\begin{bmatrix} 5 & 2 \\ 5 & 3 \end{bmatrix} \begin{bmatrix} -6 & 2 \\ -3 & 9 \end{bmatrix}$$

Evaluate the determinant of the matrix.

45	4	-1	46	-3	-4
101	-9	2		1	2

$$39. \begin{bmatrix} 4 & 7 \\ -5 & 1 \end{bmatrix} - \begin{bmatrix} -3 & -2 \\ 0 & 6 \end{bmatrix}$$

42.
$$X + \begin{bmatrix} 2 & -5 & 8 \\ -8 & 3 & 0 \end{bmatrix} = \begin{bmatrix} 6 & -1 & 9 \\ -5 & 2 & 8 \end{bmatrix}$$

$$44. \begin{bmatrix} 2 & 5 & -8 \end{bmatrix} \begin{bmatrix} -6 \\ 8 \\ 2 \end{bmatrix}$$

Determine whether the matrix has an inverse. If an inverse exists, find it.

47.	-5	-18	48.	2	4	
	2	7		1	3	

Determine whether the function is linear or quadratic. Identify the quadratic, linear, and constant terms.(#49-50)

49. $y = (x + 1)(6x - 6) - 6x^{2}$ 51. Write $y = 2x^{2} + 12x + 14$ in vertex form.

Factor the expression.

- 53. $-15x^2 21x$
- 55. $x^2 + 14x + 48$
- 57. $3x^2 + 26x + 35$
- 59. $9x^2 16$

Simplify the expression.

61. (-1 + 6i) + (-4 + 2i)

- 63. (2 + 5i)(-1 + 5i)
- 65. Find the missing value to complete the square. $x^{2} + 2x +$ _____

50. y = (x + 5)(2x + 1) - 2x52. Write $y = 3x^2 - 12x + 14$ in vertex form.

54.
$$8x^2 + 12x - 16$$

56. $x^2 - 6x + 8$
58. $5x^2 - 22x - 15$
60. $4x^2 + 12x + 9$

62.
$$(2 - 5i) - (3 + 4i)$$

64. $(1 - i)(5 - 2i)$

 $68 x^2 + 10x + 35 = 0$

66. Find the missing value to complete the square. $x^2 + 24x +$

Solve the quadratic equation by completing the square. 67. $x^2 + 10x + 14 = 0$

Use the Quadratic Formula to solve the equation. 69. $5x^2 + 9x - 2 = 0$ 70. Given the system of constraints, name all vertices. Then find the maximum value of the objective function C = 4x - 3y

 $\begin{cases} x \ge 0\\ y \ge 0\\ 6x - 2y \le 12\\ 4y \le 4x + 8 \end{cases}$

Match each equation/inequality with its graph. Not all of the graphs will be used.



Fall Final Review Answer Section

1.	c + o + b = 10 .65c + .70o + .75b = 6.85 c = b + 3	26. 27	4 9 -3			quadratic term: $2x^2$ linear term: $9x$
2.	y = .36x + .77	27.	-5		7 1	$\frac{2}{(2+1)^2}$
3.	whole numbers, integers,	28.	$-\frac{1}{2}$		51.	y = 2(x+3) - 4
	rational numbers, real		2.4.22		52.	$y = 3(x - 2)^2 + 2$
	numbers	29.	$y = \frac{4}{5}x + \frac{22}{5}$		53.	-3x(5x + 7)
4.	50 students	20	5 5 u - 3u 6		54	$-4(-2x^2 - 3x + 4)$
5.	17 mi/gal; $R = 17C$	50. 21	y = -3x - 0		55	(r + 6)(r + 8)
6.	h = 42t + 21	51.	yes, $\kappa = 1.2$		55.	(x + 0)(x + 0) (x - 2)(x - 4)
	[32.	yes; $k = \frac{5}{6}$		50.	$(\lambda = 2)(\lambda = 4)$
7.	10 23 18	22	0		57.	(3x + 3)(x + 7)
	17 31 26	33. 24			58.	(5x + 3)(x - 5)
	The dimensions are 2×3	34. 25	(2, 1, 1)		59.	(3x + 4)(3x - 4)
8	8-niece $-$ \$10, 12-	<i>3</i> 5.	(5, 3)		60.	$(2x + 3)^2$
0.	piece = \$15, 16-piece = \$20	36.	(-1, 0)		61.	-5 + 8i
	$\int a = 2.00d + 34.00$	37.	3 2, -7		62.	-1 - 9i
9.	a. {		-7 2		63.	-27 + 5i
	c = 3.25d + 29.00	38.	, <u> </u>		64.	3 – 7i
	b. 4		[4 1]		65.	1
10.	1,000 units; \$800				66.	144
11.		39.	7 9		<u> </u>	5 + 11
	a. $P = 0.38x^2 - 2.45x + 5.10$		-5 -5		67.	-) ± √11
	b. 13,830 bacteria	40	t = -8 $y = 6$		68.	-5 ± i√10
12.	21	40.	i = -6, y = 0		60	¹ 2
13.	-1	4.1	-2 -11		09.	5' -2
14.	19y - 9	41.			70.	(0, 2), (2, 0), (4, 6);
15	-17					maximum value of 8
16	2				71.	С
17	$\frac{3}{3}$, $\frac{3}{2}$,	42.		72.	72.	D
17.	2 ' 2 '		[3 -1 8]		73.	G
18.	2, -10		[]		74. 75	A
10	3.3.	43	-36 28		15. 76	Б
19.	$-2^{l}, 2^{l}$	13.	-39 37		70. 77	I Ц
20.	6, -10	4.4			77. 78	K
21	r = -2	44. 45	[12]		79.	J
21.	$x = \frac{1}{a+b}; a \neq -b$	45.	-1		80.	Ľ
		46.	-2 []			
-22.	$x \le 5$ and $x \ge -1$		7 18			
←+		47.		71.		
-3	-2 -1 0 1 2 3 4 5 6 7		[-2 -5]			
23.	$x \leq -12$ or $x \geq 10$					
←		48.	/2 -2			
-20	0-15-10-5 0 5 10 15 20		-1/2 1			
24.	2	40	[/ ²]			
25	.7	49.	linear function			
23.	6		constant term: 6			
		50	constant term0			
		30.	quadratic function			