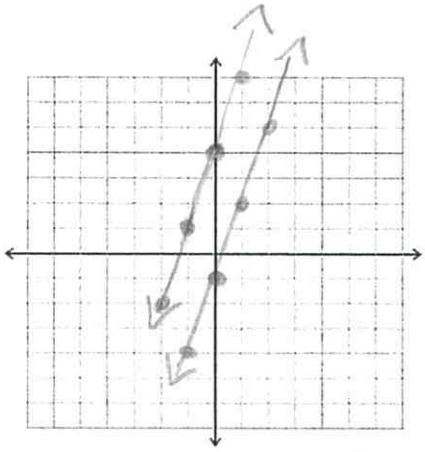
Algebra 1 – Final Exam Review
Second Semester

Name Talley
Date _____ Hour _____

Chapter 7 **PART 1**

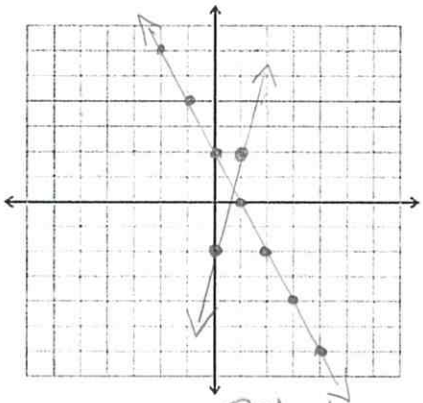
For #1-3, graph each system of equations. Tell whether the system has no solution, one solution, or infinitely many solutions.

1. $y = 3x - 1$
   $y = 3x + 4$



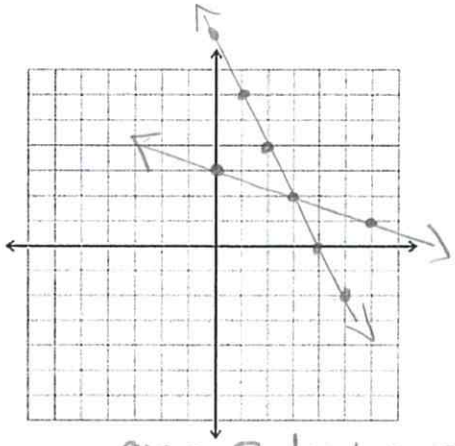
NO Solution

2. $y = 4x - 2$
   $y = -2x + 2$



one solution

3. $x + 3y = 9$
   $2x + y = 8$



one solution

4. The length of a rectangle is 2 in more than four times the width. If the perimeter of the rectangle is 64 in, what are its dimensions?

w = 6 in
L = 26 in

Solve each system of equations by substitution.

5. $y = x + 3$
   $y = 3x + 1$

(1, 4)

6. $x + 2y = -1$
   $y = 3x - 11$

(3, -2)

7. $y = x - 7$
   $2x + y = 8$

(5, -2)

Chapter 7 (cont.)

Solve this system of equations by elimination.

8. $3x - 2y = -8$
   $2x + 2y = -2$
   $(-2, 1)$

9. $3x + y = 20$
   $x + y = 12$
   $(4, 8)$

10. $x + 8y = 28$
    $-3x + 5y = 3$
    $(4, 3)$

11. Write an equation of a line with slope 2 and passes through the point (-4,-3).

$y + 3 = 2(x + 4)$

12. Ashlyn runs at an average rate of 4 miles per hour. She walks at a rate of 2 miles per hour. Write an equation in standard form to relate the times she could spend walking and running to travel a distance of 12 miles. Let x represent the time spent running and let y represent the time spent walking.

$4x + 2y = 12$

13. Identify the slope and a point from the given equation. $y - 3 = 4(x + 6)$

$m = 4$

point $= (-6, 3)$

14. Find the x and y intercepts $-3x + 2y = 6$.

x-intercept: -2
y-intercept: 3

15. Find the slope and y-intercept of the equation: $y + -2x = -8$

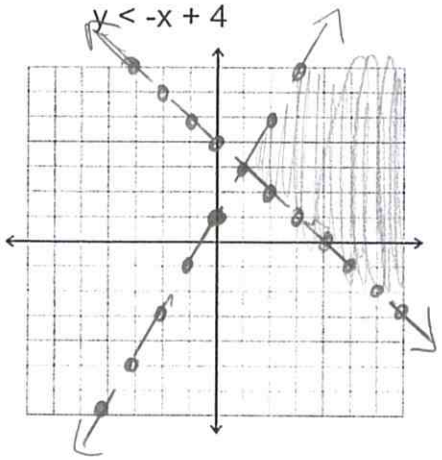
$m = 2$
$b = -8$

Chapter 7 (cont.)

16. Graph the following systems of inequalities and show the viable solution region.

$y > 2x + 1$

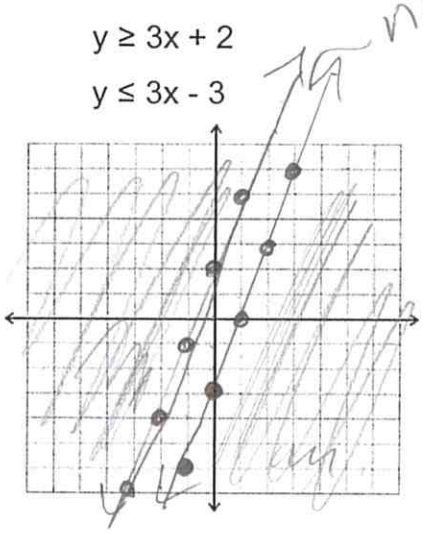
$y < -x + 4$



$y \geq 3x + 2$

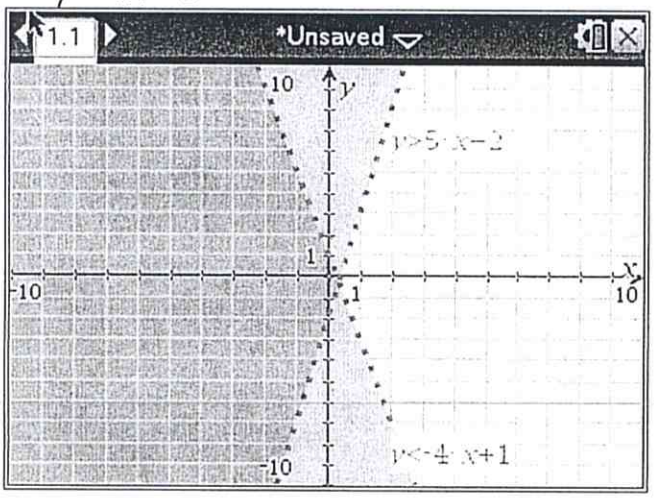
$y \leq 3x - 3$

no solution



$y > 5x - 2$

$y < -4x + 1$



A. Choose all of the ordered pairs that are solutions for the system (if any).

(0, 4) (0, -5) (-3, -3) (0, 2) (1, 3)

B. Write 5 additional solutions to the system of linear inequalities.

_____ _____ _____ _____ _____

pick 5 ordered pairs in the dark grey area.

Semester 2 Final Exam Review - PART 2

Chapter 8

Simplify each expression.

18. 3^{-2} $1/9$

19. $\frac{7}{a^{-3}b^2} = \frac{7a^3}{b^2}$

20. $-4x^2 \cdot 5x^3$ $-20x^5$

21. $\frac{5x}{10x^3}$ $1/x^2$

22. $(2rs^4)^3 (rs)^5$ $8r^8s^{17}$

23. $(3m^6)(m^2)(4k^0)$ $12m^8$

24. $(4b^3)^2$ $16b^6$

25. $\left(\frac{-3a^4b^{-3}c^2}{-2a^{-8}b^9c^{-3}}\right)^0$ 1

26. $\frac{-2x^5y^{-3}}{z^{-2}}$ $-\frac{2x^5z^2}{y^3}$

27. $-3d^{-4} \cdot 5d^9$ $-15d^5$

28. $\left(\ \ \right)^0$ 1

29. $(t^{-2})^6$ $1/t^{12}$

30. $\frac{x^8}{x^{-7}}$ x^{15}

31. $a(a^4b^{-2})^3$ $\frac{a^{13}}{b^6}$

32. $\frac{x^{14}}{x^7}$ x^7

33. $\frac{x^{15}}{x^{-4}}$ x^{19}

34. Evaluate $\frac{x^{-3}}{y^{-2}}$ if x = 3, y = -2 $4/27$

35. Evaluate $4x^2y^{-3}$ for x = -2 and y = 3 $16/27$

Chapter 9

Simplify each expression. Combine like terms. Remember to write your answer in standard form.

36. $(4x^2 - 5x) - (2x^2 - 3x + 3)$

$2x^2 - 2x - 3$

37. $9 + 11x^2 + 3x + 5x^2$

$16x^2 + 3x + 9$

38. $(n^4 + 2n - 1) + (5n - n^4 - 4)$

$7n - 5$

39. $(6 - 3x^2) + (x^3 - x + 5)$

$x^3 - 3x^2 - x + 11$

40. $(-7x - 5x^3 + 5) - (-7x^3 - 5 - 9x)$

$2x^3 + 2x + 10$

41. $(5x^2 - 10x + 3) + (6x^2 + 4x + 3)$

$11x^2 - 6x + 6$

Simplify each expression.

42. $-2n(n^2 - 3n + 4)$

$-2n^3 + 6n^2 - 8n$

43. $5k^2(3k^2 + 4k - 2)$

$15k^4 + 20k^3 - 10k^2$

44. Factor the polynomial $6x^3 + 3x^2 + 9x$. (Divide out the G.C.F.)

Simplify. Use distributive property/FOIL method.

45. $(4x + 3)(2x + 1)$ $8x^2 + 10x + 3$

46. $(4h - 5)(5h - 6)$ $20h^2 - 49h + 30$

47. $(3x - 7)(3x + 3)$ $9x^2 - 12x - 21$

48. $(3x + 4)^2$ $9x^2 + 24x + 16$

49. $(3m^2 - 4)(3m^2 + 4)$ $9m^4 - 16$

50. $(2n^2 + 4)(3n + 2)$

$6n^3 + 4n^2 + 12n + 8$

Factor each expression. Use the factor box and fraction method. Check for a G.C.F. first!

51. $x^2 + 14x + 13$ $(x+1)(x+13)$

52. $x^2 - 12x + 36$ $(x-6)^2$

53. $2x^2 - 2x - 112$ $2(x-8)(x+7)$

54. $12x^2 + 4x - 1$ $(2x+1)(6x-1)$

55. $3x^2 - 21x + 30$ $3(x-2)(x-5)$

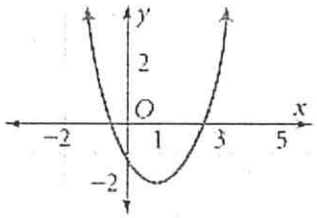
56. $x^2 - 144$ $(x+12)(x-12)$

Semester 2 Final Exam Review - PART 3

Chapter 10

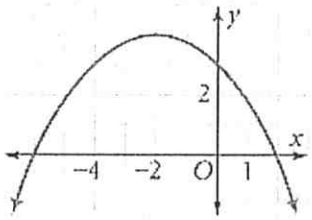
57. Identify the vertex of each graph and tell whether it is a minimum or a maximum.

a.



vertex
(1, −2)
minimum

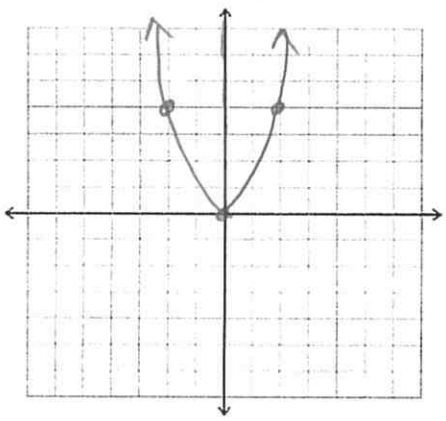
b.



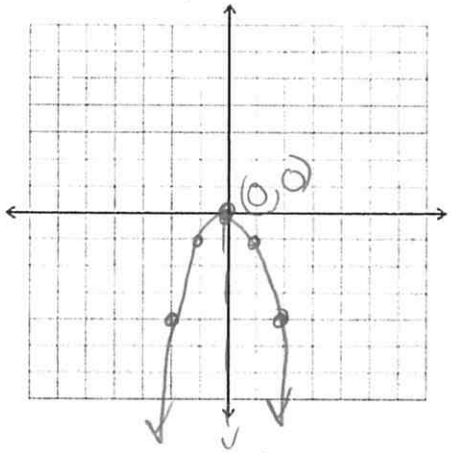
vertex
(−2, 4)
maximum

Graph each equation. **Label the vertex and the axis of symmetry.**

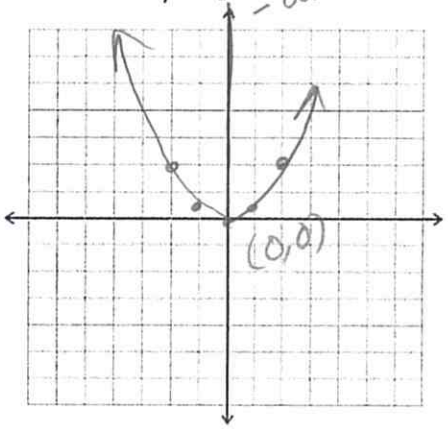
58. $y = x^2$ aos (0,0) vertex



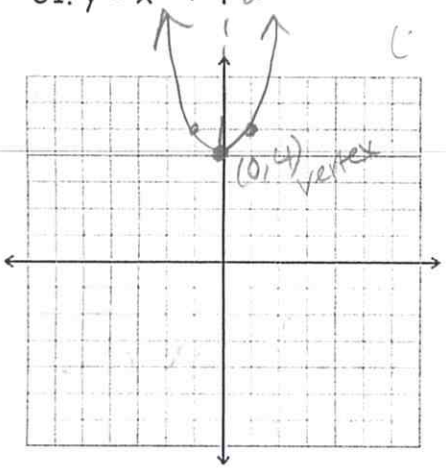
59. $y = -x^2$



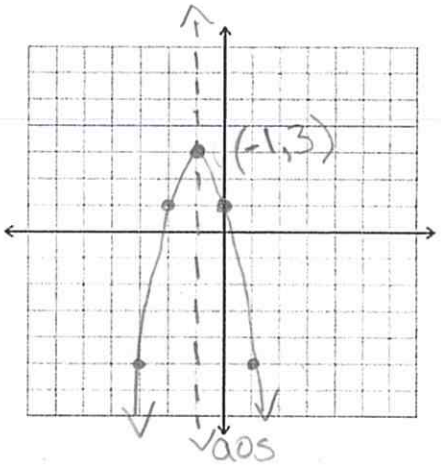
60. $y = \frac{1}{2}x^2$ aos



61. $y = x^2 + 4$ aos



62. $y = -2x^2 - 4x + 1$



63. Find the equation of the axis of symmetry and the coordinates of the vertex of the graph of the function $y = 2x^2 + 8x - 1$. aos $x = -2$ vertex $(-2, -9)$

64. A ball is thrown into the air with an upward velocity of 48 ft/s. Its height h in feet after t seconds is given by the function $h = -16t^2 + 48t + 4$. What does the 4 represent in this function? The ball was thrown from a height of 4 feet.

Chapter 10 continued

Solve each quadratic equation using square roots.

65. $k^2 = 16$

$k = \pm 4$

66. $4x^2 + 6 = 10$

$x = \pm 1$

67. $x^2 + 15 = 9$

no solution

Solve each quadratic equation using the Zero-Product Property.

68. $(x - 5)(x + 3) = 0$

$x = 5$ or $x = -3$

69. $(2x + 3)(4x - 5) = 0$

$x = -\frac{3}{2}$ or $x = \frac{5}{4}$

Solve each quadratic equation by factoring. (Check for a G.C.F. first.)

70. $z^2 + 6z - 27 = 0$

$x = -9$ or $x = 3$

71. $3x^2 + 3x - 6 = 0$

$x = 1$ or $x = -2$

72. $c^2 - 3c = 0$

$x = 3$ or $x = 0$

Solve each quadratic equation using the quadratic formula.

73. $-x^2 - 12x = 20$

$x = -2$ or $x = -10$

74. $x^2 - 6x = 7$

$x = 7$ or $x = -1$

75. $2x^2 - 7x - 13 = 0$

$x = 4.84$ or $x = -1.34$

76. Write the equation in standard form: $f(x) = 2(x - 3)^2 - 2$

$f(x) = 2x^2 - 12x + 16$

77. Identify the vertex of the following equation: $f(x) = -2(x + 5)^2 - 6$

Vertex: $(-5, -6)$