

Algebra I: Review for Second Semester EXAM

This handout is intended as a study tool. You are also expected to study your notes and quizzes from the entire semester. Rework examples from the notes and rework all problems from quizzes.

Chapter 7: Systems of Equations

1. Solve using substitution: $8x + 2y = -2$
 $y = -5x + 1$

2. Solve using addition/elimination: $3x + 2y = -19$
 $x - 12y = 19$

3. If you are solving $y + 6x = 2$
 $4x - 10y = 4$ by substitution, what expression would you substitute into the second equation for y ?

4. If you are solving $-3x + y = -1$
 $x + 3y = 3$ by substitution, what expression would you substitute into the first equation for x ?

5. If you solve $2x + 5y = -22$
 $10x + 3y = 22$ by addition/elimination and you multiply the first equation by 3, then by what number should you multiply the second equation?

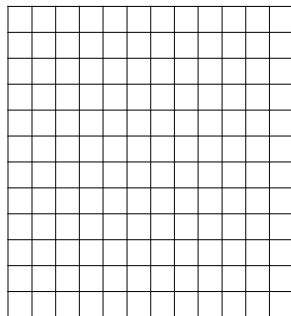
6. If you solve $-2x + 5y = 20$
 $3x - 7y = -26$ by addition/elimination and you multiply the second equation by 2, then by what number should you multiply the first equation?

7. If you graphed the system $\begin{cases} 2x + y = 1 \\ y = -2x - 3 \end{cases}$, describe what kind of lines and how many solutions you would have.

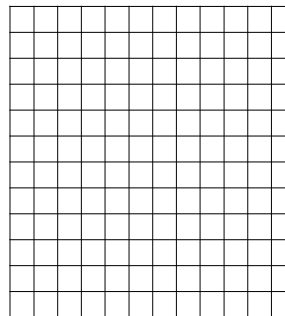
8. If you graphed the system $\begin{cases} y = 3x + 4 \\ -12x + 4y = 16 \end{cases}$, describe what kind of lines and how many solutions you would have.

9. Sarah and Cody bought some party supplies. Sarah bought 3 packages of balloons and 4 packages of favors for \$14.63. Cody bought 2 packages of balloons and 5 packages of favors for \$16.03. Find the price of a package of balloons.

10. Graph $y > 2x + 3$



11. Graph $\begin{cases} y \leq x \\ y \geq -x - 3 \end{cases}$



Chapter 8: Exponents

Simplify each of the following

12. $8x^0$

13. $(2b^4)^0$

14. $\frac{x^{-4}y^3z^{-2}}{x^{-5}yz^3}$

15. $-x \cdot (-3x^3) \cdot (2x)^2$

16. $7^{-2}p^{-4}$

17. $(-2)^{-3}$

18. $\left(\frac{2}{3}\right)^{-3}$

19. $(2x^2y^{-2})^5(4xy^{-3})^{-2}$

20. Evaluate $(-p)^2 q^{-2}$ if $p = 2$ and $q = -3$

21. Evaluate $-p^2 q^3$ if $p = 2$ and $q = -3$

22. Write in scientific notation: 0.00426

23. Write in standard notation: 2.3×10^4

24. Multiply and write your answer in scientific notation: $(3 \times 10^4)(8 \times 10^{-2})$

Chapter 9: Polynomials and Factoring

25. Name the polynomial by its degree and number of terms: $4x^3 - 2$

26. Name the polynomial by its degree and number of terms: $2x^2 - x + 5$

Perform each operation:

27. $(7y^2 - 3y + 4) + (8y^2 - 7)$

28. $(7p^2 + 4p - 8) - (3p^2 - 2p + 10)$

29. $-5x(3x - 2)$

30. $7q^2(-q^2 + 5q - 3)$

31. $(2x - 1)(x + 3)$

32. $(x - 5)(x^2 - 2x + 3)$

33. $(x - 3)^2$

34. $(2x + 1)^2$

35. Factor by taking out a GCF: $10b^2 - 5b$

Completely factor each of the following:

36. $x^2 - 14x - 32$

37. $y^2 + y - 20$

38. $x^2 + 7xy - 18y^2$

39. $2k^2 + 20k + 32$

40. $16x^2 - 9$

41. $3x^2 - 27$

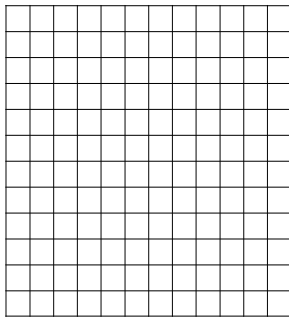
Chapter 10: Quadratic Equations and Functions

42. Find the axis of symmetry for the equation: $f(x) = x^2 - 8x + 2$

43. Find the vertex for the graph of the function: $y = 2x^2 + 4x - 5$

44. Find the vertex for the graph of the function: $y = 3x^2 + 4$

45. Graph: $y = x^2 - 2x + 1$. Show all steps.



46. Between what two consecutive integers is $\sqrt{35}$?

47. Between what two consecutive integers is $-\sqrt{90}$?

48. Solve: $2x^2 - 8 = 0$

49. Solve: $\frac{1}{4}x^2 - 1 = 0$

50. Solve $(x-3)^2 = 16$

51. Solve $(x+2)^2 = 25$

52. If you solve $x^2 - 16x = 16$ by completing the square, what number must you add to both sides of the equation?

53. If you solve $x^2 + 10x = 12$ by completing the square, what number must you add to both sides of the equation?

54. Solve by completing the square: $x^2 - 8x - 48 = 0$

55. Solve using the Quadratic Formula: $2x^2 + 5x + 3 = 0$

56. Determine the number of solutions the equation $x^2 + 2x + 1 = 0$ has.

57. Determine the number of solutions the equation $2x^2 + 4x + 15 = 0$ has.

Simplify each square root completely:

58. $\sqrt{\frac{4}{25}}$

59. $\sqrt{a^8b^7c^6}$

60. $\sqrt{\frac{1}{5}}$

61. $\frac{3}{\sqrt{12}}$

62. $\sqrt{\frac{18}{3}}$

63. $\sqrt{72x^5}$

64. $\sqrt{8} \cdot \sqrt{10}$

65. $5\sqrt{8x} \cdot \sqrt{32x^5}$

66. $\frac{\sqrt{90}}{\sqrt{5}}$

67. Find the missing length of the right triangle: $a=1.2$ and $b=0.9$

Simplify each expression:

67. $\sqrt{2}(\sqrt{8}-3\sqrt{12})$

68. $(\sqrt{3}-\sqrt{2})^2$

69. $4\sqrt{3}-\sqrt{27}$

70. $\sqrt{45}+5\sqrt{20}$

71. $\sqrt{40}+\sqrt{90}$

72. $(4-3\sqrt{2})^2$

Solve each radical equation:

73. $x = \sqrt{x+6}$

74. $\sqrt{4x-1} = 15$

75. $8 - \sqrt{2n} = 20$

Chapter 12: Rational Expressions and Functions:

Simplify each of the following:

76. $\frac{x^2-4}{x-2}$

77. $\frac{-3y}{y^3-y^2}$

78. $\frac{6x-18}{3-x}$