

Name: _____

Mod: _____

Algebra 1 Advanced

Mrs. Crocker

Final Exam Review

Spring 2016

The exam will cover Chapters 5 – 10, 12
You must bring a pencil, calculator, and eraser to the exam.

To best prepare, PRACTICE, PRACTICE, PRACTICE! Do not just complete these few assignments and be done, go back and look over each problem and keep practicing the steps.

You may bring a 3x5 notecard to the exam. This notecard must be handwritten and you may use both sides for information that you may find helpful on the exam. Please put your name on the notecard, I will collect it after the exam.

For potential extra credit and definitely extra practice, complete:

1. Exam Review Packet (attached)
2. MathXL Semester 2 Exam Practice

The exam will consist of three parts: Multiple Choice, Written Free Response, and Mental Math.

Mod 5-6: Monday 6/6 from 9:35 – 11:35

Mod 14-15: Friday from 12:25 – 2:25

Chapter 5 – Linear Functions

Answer the following problems. Use a pencil and show work.

Find the slope of the line that goes through the given points. Tell whether the line is increase, decreasing, vertical, or horizontal.

1. $(5, 1)$ and $(10, -6)$

2. $(-2, -1)$ and $(-2, 6)$

3. State the independent and dependent variables in the linear relationship. Then find the rate of change for the situation.

The cost of dinner is \$70 for five teens and \$112 for eight teens.

The pair of points lie on the same line with the given slope. Find the missing value.

4. $(6, 10)$ and $(x, 14)$; $m = 2$

5. $(-3, 1)$ and $(x, 6)$; $m = 1$

6. Suppose y varies directly with x . Write a direct variation equation that relates x and y . Then find the value of y when $x = 12$.

$y = 5$ and $x = 3$

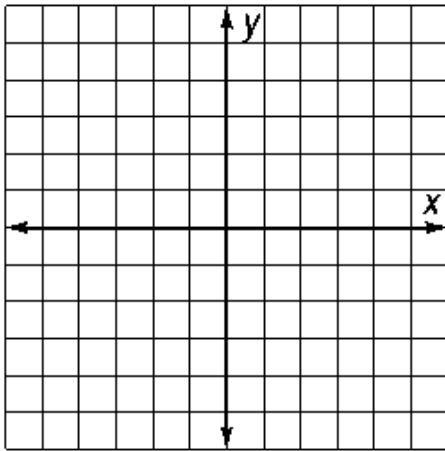
Write the linear equation in Standard Form:

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

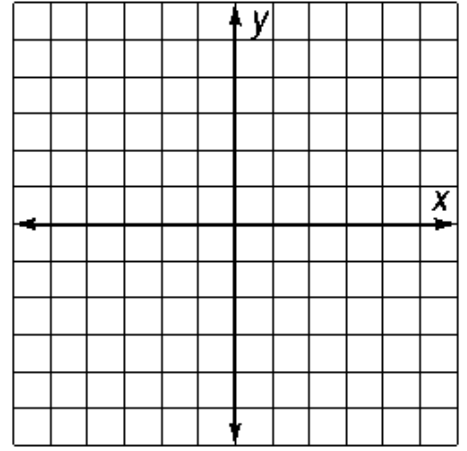
8. $y - 3 = \frac{1}{3}(x + 6)$

Graph the linear functions using slope-intercept form (no table!)

9. $y = 2x + 1$



10. $y = -\frac{1}{5}x + 4$



11. Write the equation of the line in slope-intercept form that passes through the given points:

$(-6,3)$ and $(4,8)$

12. Write the equation of the line that is perpendicular to the given line through the given point:

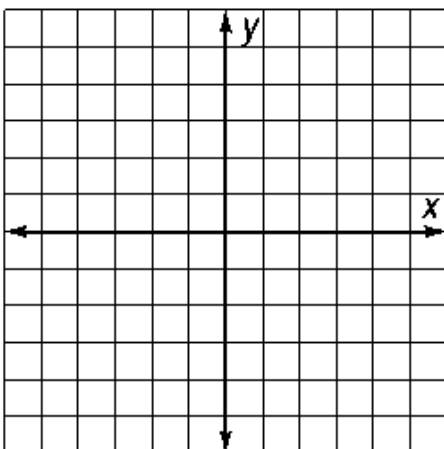
$y = \frac{1}{2}x + 3$; $(-2,1)$

13. Write the equation of the line that is parallel to the given line through the given point:

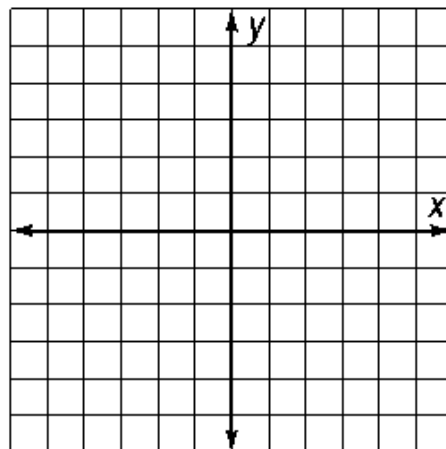
$y = \frac{1}{2}x - 3$; $(4,-2)$

Graph the absolute value functions.

14. $y = |x - 2|$



15. $y = -2|x| + 1$

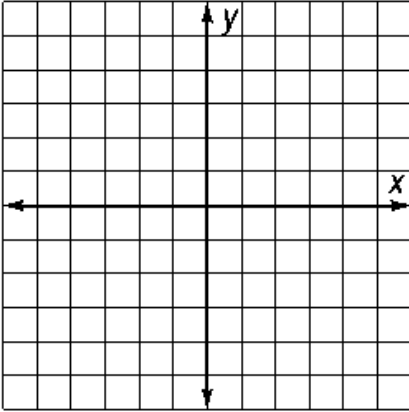


Chapter 6 – Systems of Equations and Inequalities

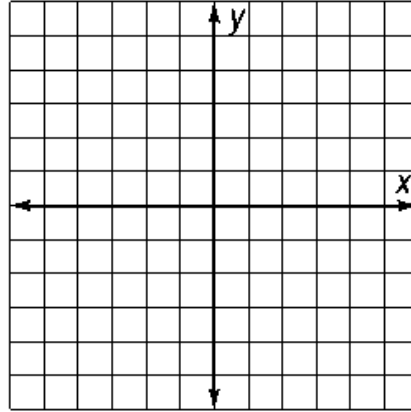
Answer the following problems. Use a pencil and show work.

For #16 & 17, solve the system graphically:

16. $y = 2x - 1$
 $x = 2$



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



18. Describe the three different types of systems:

- a). Consistent and Independent:
- b). Consistent and Dependent:
- c). Inconsistent

For #19 & 20, solve the system using substitution:

19. $x - y = -2$
 $-5x + 5y = 10$

20. $x = 2y$
 $2x + 6y = 15$

For #21 & 22, solve the system using elimination:

21. $4x + 3y = -19$
 $3x - 2y = -10$

22. $-2x + 5y = 7$
 $-2x + 5y = 12$

For #23 – 24, solve using any algebraic method. Write a system and define your variables.

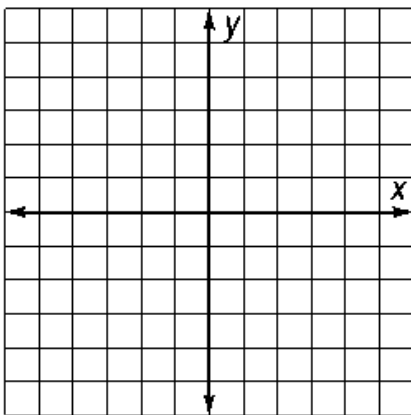
23. A corner store sells two kinds of baked goods: cakes and pies. A cake costs \$15 and a pie costs \$6. In one day, the store sold 12 baked goods for a total of \$108. How many cakes did they sell?

24. Sharon has some one-dollar bills and some five-dollar bills. She has 14 bills. The value of the bills is \$30. Solve a system of equations to find how many of each kind of bill she has.

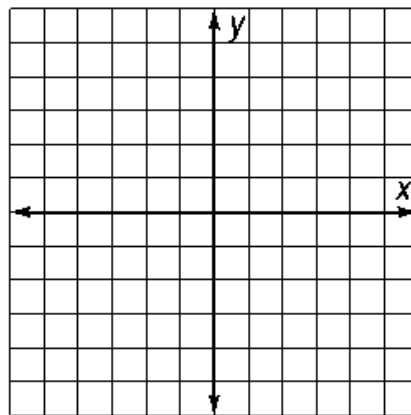
25. At the local ballpark, the team charges \$8 for each ticket and expects to make \$1,100 in concessions. The team must pay its players \$2,100 and pay all other workers \$1,200. Each fan gets a free bat that costs the team \$4 per bat. How many tickets must be sold to break even?

For #26 & 27, graph the solution to the system of linear inequalities:

26. $y \geq -x + 1$
 $y < 3x - 2$



27. $2x - \frac{1}{4}y < 1$
 $4x + 8y > -24$



Chapter 7 – Exponents & Exponential Functions

Answer the following problems. Use a pencil and show work.

For #28 – 33, simplify each expression:

28. $\frac{12}{x^{-9}h^3}$

29. $(x^3)^4$

30. $y^3(y^{\frac{7}{4}})^{-4}$

31. $(-6x^6)(3y^9)(6x^6)$

32. $\left(\frac{m^{-1}m^5}{m^{-2}}\right)^{-3}$

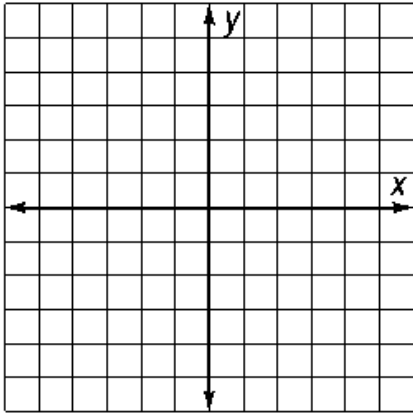
33. $\left(4x^{\frac{5}{2}}\right)^6(x^5)^3$

34. Last year, a large trucking company delivered 6.0×10^5 tons of goods with an average value of \$20,000 per ton. What was the total value of the goods delivered? Write the answer in scientific notation.

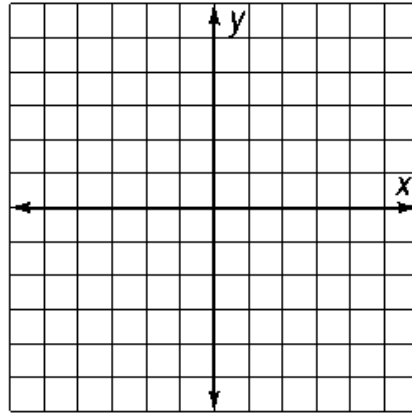
35. Suppose a population of 200 crickets doubles in size every month. The function $f(x) = 200 \cdot 2^x$ gives the population after x months. How many crickets will there be after 3 years? Give answer in scientific notation.

For #36 & 37, provide a table and graph the exponential function:

36. $y = 4 \cdot 5^x$



37. $y = -\left(\frac{1}{2}\right)^x$



38. Suppose the population of a town is 19,000 and is growing 2% each year. Write an exponential growth function and predict the population after 11 years.

39. A tractor costs \$15,100 and depreciates in value by 9% per year. Write an exponential decay function and predict how much it will be worth after 9 years.

40. Suppose that the amount of algae in a pond doubles every 3 hours. If the pond initially contains 50 pounds of algae, how much algae will be in the pond after 8 hours?

41. Steve invests \$4000 in a money market account that pays 1.25% interest compounded monthly. Use the compound interest formula to find how much will be in the account after 4 years.

42. Shelly invests \$10,000 in a money market account that pays 2.5% interest compounded annually. Use the compound interest formula to find how much will be in the account after 12 years.

Chapter 8 – Polynomials & Factoring

Answer the following problems. Use a pencil and show work.

For #43 & 44, what is the degree of the monomial?

43. $7x^3y$

44. 6

For #45 & 46, what is the degree of the polynomial?

45. $2x^2 - 5x$

46. $6x^4 - 7x + 1$

For #47 & 48, simplify, write in standard form and name the polynomial based on its degree and number of terms.

47. $(4x^2 - 6x - 4) - (5x^2 + 2x - 2)$

48. $10x - 8x^3 + 6x^2 - 9$

For #49 – 52, multiply the polynomials:

49. $3x(2x^2 - 4x + 1)$

50. $(3x - 1)(4x + 2)$

51. $(2x - 5y)^2$

52. $(2x + 3)(2x - 3)$

For #53 – 62, factor each of the following. Be sure to look for a GCF first.

53. $x^2 + 5x - 24$

54. $2x^2 + 9x - 5$

55. $4x^2 + 2x - 6$

56. $8x^2 - 18$

57. $4x^2 - 81y^2$

58. $9x^2 + 57x + 60$

59. $4x^2 + 4x + 1$

60. $18x^2 - 32$

61. $3x^2 + 16x + 20$

62. $4x^2 + 28x + 40$

For #63 – 66, factor by grouping.

63. $3x^3 + 2x^2 - 9x - 6$

64. $6x^3 + 2x^2 - 24x - 8$

65. $4x^3 + 16x^2 - 20x - 80$

66. $3x^4 + 2x^3 - 3x^2 - 2x$

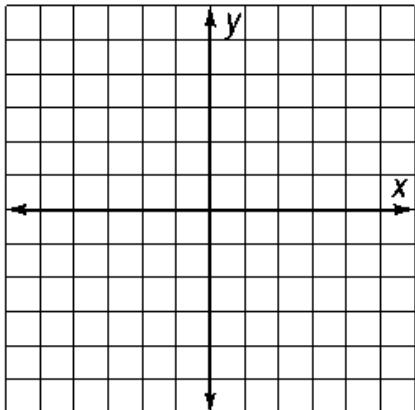
67. The volume of a box ($V = LWH$) is given by the trinomial $x^3 + 2x^2 - 63x$. What are the dimensions of the box? Factor.

Chapter 9 – Quadratic Functions & Equations

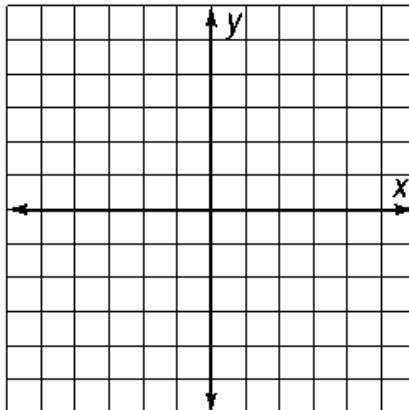
Answer the following problems. Use a pencil and show work.

For #68 – 71, graph the quadratic. Identify the Axis of Symmetry, Vertex, Domain, and Range.

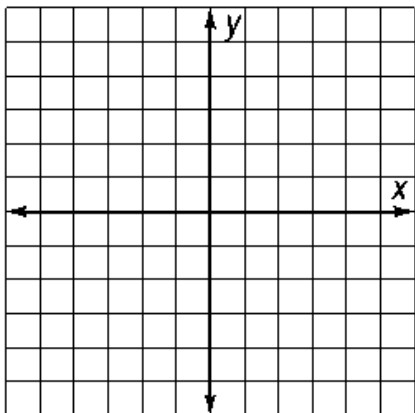
68. $y = -2x^2$



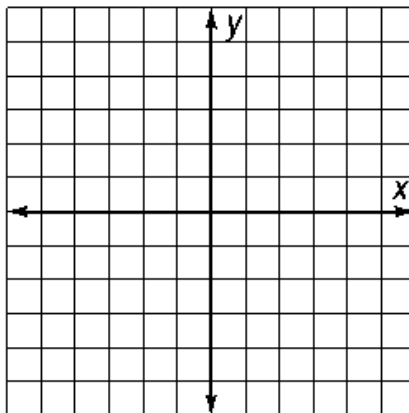
69. $y = 3x^2 - 5$



70. $y = 2x^2 - 2x + 1$



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



For #72 & 73, solve the quadratics using square roots:

72. $3x^2 + 11 = 86$

73. $3x^2 + 12 = 0$

For #74 – 77, solve the quadratics by factoring:

74. $x^2 - 8x + 15 = 0$

75. $2x^2 - 3x - 9 = 0$

76. $8x^3 - 32x = 0$

77. $25x^2 - 20x = -4$

For #78 – 81, solve the quadratics by completing the square:

78. $x^2 - 2x = 9$

79. $2x^2 + 12x = -4$

80. $x^2 + 3x = -1$

81. $3x^2 + 2x - 9 = 0$

82. Order the group of quadratic functions from widest to narrowest graph.
 $y = -2x^2; y = -4x^2; y = -3x^2$

83. Does the table represent a linear or an exponential function?

x	1	2	3	4
y	1	3	5	7

84. How is the graph of $y = -4x^2 + 2$ different from the graph of $y = 4x^2$? Name two differences.

Chapter 10 - Radicals

Answer the following problems. Use a pencil and show work.

For #85 – 88, simplify the radical.

$$85. \quad \frac{1}{3}\sqrt{72}$$

$$86. \quad 5\sqrt{12x} \cdot 4\sqrt{28x}$$

$$87. \quad \frac{1}{2}\sqrt{48x^3} \cdot \sqrt{5}$$

$$88. \quad -4\sqrt{2x^4} \cdot 3\sqrt{6y} \cdot \sqrt{5}$$

For #89 – 94, add, subtract or multiply the radicals and simplify.

$$89. \quad -\sqrt{45} + 2\sqrt{125}$$

$$90. \quad (3\sqrt{3} + \sqrt{5})(\sqrt{3} - 6\sqrt{5})$$

$$91. \quad \sqrt{3}(2\sqrt{2} - \sqrt{3})$$

$$92. \quad (\sqrt{10} + \sqrt{3})(\sqrt{10} - \sqrt{3})$$

$$93. \quad (6\sqrt{2} + 2)^2$$

$$94. \quad (2\sqrt{2} - 5)(2\sqrt{2} + 5)$$

For #95 & 96, solve the proportion:

$$95. \quad \frac{3}{1-\sqrt{5}} = \frac{1+\sqrt{5}}{x}$$

$$96. \quad \frac{-2\sqrt{3}}{2+\sqrt{3}} = \frac{2-\sqrt{3}}{x}$$

For #97 – 102, solve the radical equation:

97. $\sqrt{x} - 6 = 2$

98. $\sqrt{2x - 5} = \sqrt{x + 4}$

99. $\sqrt{5x + 4} - \sqrt{x} = 0$

100. $\sqrt{-x + 6} = x$

101. $\sqrt{4x - 8} = x - 2$

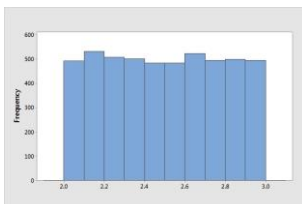
102. $\sqrt{3x + 7} = x + 1$

Chapter 12 – Data Analysis & Probability

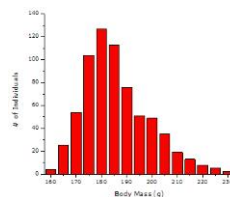
Answer the following problems. Use a pencil and show work.

Describe the shape of the histogram.

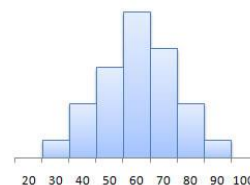
103.



104.



105.



106. A basketball player's points per game are listed below.
Make a cumulative frequency table and a histogram.

16 8 19 12 9 10 11 9 12 23 5 20 13 6 17

107. The hours per week that a school band practiced are listed below. What are the mean, median, mode, and range of their practice times? Which measure of central tendency best describes the practice times?

108. Find the value of x such that the data set has the given mean.

100 121 105 113 108 x *mean* = 112

109. Make a box plot for the data set.

Commute (mi): 8 33 28 7 42 9 30 38 22 6 37

