

Honors Algebra II Summer Packet

This summer packet is for all students enrolled in Algebra II Honors for the 2009-2010 school year. The entire packet will be due on the second day of class and will count as part of your first quarter grade. You are expected to bring this completed packet to class on the first day of school, as we will be answering questions on it that day, and the test on the packet is the second day of class. The test on this packet is an objectives based test. The objectives are Algebra I objectives and are outlined in this packet. **Follow the directions in the packet and do all of the exercises, neatly showing all of your work in the packet when asked.** Upon completion of each section, check your answers with the correct answers that are provided at the Chantilly website, under summer assignments. **Remember that you will have a test on this material on the second day of class. Follow directions to get the best possible grade on this packet !!!!** If you have forgotten how to do any of the problems in the packet, use the internet to “google” the objectives for help.

We will be using graphing calculators throughout the course. We recommend purchasing the TI-83 Plus, or TI-84 Plus. **Do not buy** a TI-92 or TI-89 because they are not allowed in class, on the SAT's, or on the Virginia SOL Test.

Please note: The decision to take an Honors class is a serious one. The work in this class will require the following,

- Exemplary work habits.
- Exemplary time management skills.
- A genuine desire to learn.
- Personal responsibility for attendance and work requirements.
- Self-discipline and determination to succeed.

If you have any questions about the requirements outlined above or the directions for completing the summer packet, please feel free to see Mrs. Christenson in room 258, Mrs. Prishack in room 260 or Ms. St. Clair in room 271 before the end of this school year. You may email Mrs. Christenson over the summer at norma.christenson@fcps.edu.

Also, be reminded, that you may not drop an Honors class until the end of the first quarter, and the grade you receive will remain your first quarter grade in regular Algebra II.

Objective 1: Classify numbers by sets.

1. Put an “x” in each box for which the number on the left of the chart belongs to the set of numbers across the top.

	Integer	Rational	Irrational	Real	Natural	Whole
a. 5						
b. $\sqrt{.25}$						
c. -7						
d. $\sqrt{3}$						
e. $\sqrt{16}$						
f. 0						
g. π						
h. 1.765						
i. $-\frac{17}{5}$						
j. $-\sqrt{6}$						

Objective 2: Simplify expressions.

Simplify the given expression. Show all work and circle your answer.

2. $5 - (3 - x)$

3. $3(6x - 5(x - 1))$

4. $7 - 2[3 - 2(x + 4)]$

5. $6 - 2[x - 3 - (x + 4) + 3(x - 2)]$

6. $6[x - 9(x - 1)] + 4[2x + 3(2x - 5)]$

7. $-(-(-(-(-x))))$

Objective 3: Identify properties.

Match the property that justifies each statement.

- | | |
|--|---|
| 8. $4 + (16 + 7) = (4 + 16) + 7$ | (a) Commutative of addition |
| 9. $x\left(\frac{1}{x}\right) = 1$ | (b) Commutative of multiplication |
| 10. $a(bc) = a(cb)$ | (c) Associative of addition |
| 11. $-8 + 0 = -8$ | (d) Associative of Multiplication |
| 12. If $\frac{m}{-10} = 3$, then $-10\left(\frac{m}{-10}\right) = -10(3)$ | (e) Distributive |
| 13. If $x - a = y$, then $x = y + a$ | (f) Additive Identity |
| 14. $3(-a + b) = -3a + 3b$ | (g) Multiplicative Identity |
| 15. $m + n + 8 = n + m + 8$ | (h) Additive Inverse |
| 16. $3d(1) = 3d$ | (i) Multiplicative Inverse |
| 17. $y^2 + (-y^2) = 0$ | (j) Addition Property of Equality |
| | (k) Multiplication Property of Equality |

Objective 4: Evaluate expressions.

Evaluate for the given value(s). Show all work and circle your answer.

18. $10(t^2 + t)$ for $t = -4$

19. $\frac{y^2 + 3y + 2}{y + 2}$ for $y = 5$

20. $-5|k + 1|$ for $k = -11$

21. $-(k - j)$ for $j = -5, k = 11$

22. $-6r + 2(s - 8)$ for $r = 8, s = -8$

23. $\frac{(a + d)^2}{-d}$ for $a = -12, d = 4$

Objective 5: Solve equations.

Solve for \underline{x} . Show all work and circle your answer.

24. $6x - 2 = 5x - 7 - 3x$

25. $3(8x - 5) = -4(7 - 6x)$

26. $3(x - 5) + 8x = 18 - (3 - 10x)$

27. $3(8x - 5) + 3 = 22x + 2(x - 6)$

28. $x - \frac{c}{2} = -\frac{3c}{2}$

29. $t = \frac{pd}{2x}$

30. $c + ax = dx$

31. $|3x + 19| = 13$

32. $\left|4 - \frac{x}{5}\right| = 10$

33. $7 - |4x + 1| = -2$

Objective 6: Solve inequalities.

Objective 7: Graph inequalities.

Solve each inequality and graph on a number line. Show all work and circle your answer.

34. $36 - 11x \geq -63$

35. $7x - 12 \leq 9(2x - 3)$

36. $5 - 3(10 - 7x) < 4(2x + 10)$

37. $12 < x + 3$ or $-5 \leq 1 - x$

38. $14 < 5 - 3x \leq 53$

39. $52 < 4 - 3x < 13$

40. $7 - 3x \geq -5$ and $-2 \leq 5 - 7x$

41. $3x - 13 < -4$ or $7 - 2x \leq 5$

42. $|-8 + x| \leq 6$

43. $|x + 7| > 12$

44. $|7 - x| < 6$

45. $|5x - 10| \geq 15$

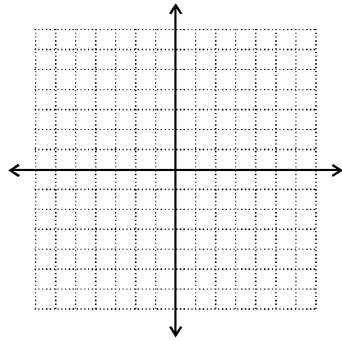
46. $|4x - 9| + 20 > 35$

47. $5 - 3|4x + 3| > 2$

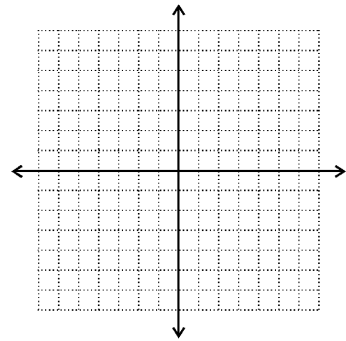
Objective 7: Graph inequalities.

Graph each inequality on a separate coordinate plane. Show all work.

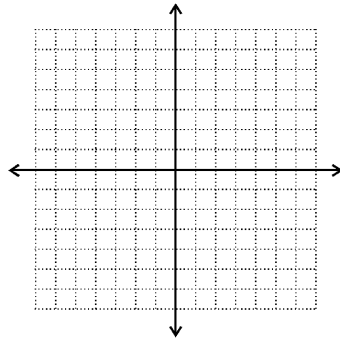
48. $x > -6$



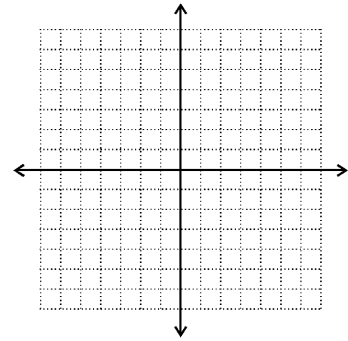
49. $x - 2y > 4$



50. $6x - 8y \geq -16$



51. $y > -x$



Objective 8: Identify slope.

Find the slope of the line. Show all work and circle your answer.

52. through $(4, 9)$ and $(11, 5)$

53. through $(8, -1)$ and $(-8, -1)$

54. through $(-3, 6)$ and $(-3, 0)$

55. $x = -2$

56. $6x - 10y = -1$

57. $y = -1$

58. parallel to $5x - y = 2$

59. perpendicular to $3x - 5y = 7$

Objective 9: Determine x intercept.

Objective 10: Determine y intercept.

Find the x and y intercepts of the line. Show all work.

60. $10x - 4y = -20$

61. $y = 2x + 3$

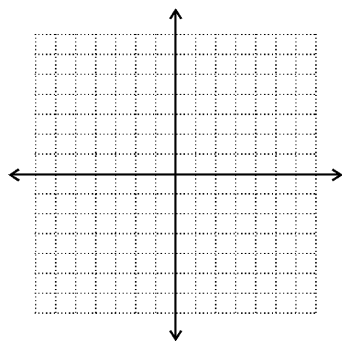
62. $x = 3$

63. $y = -7$

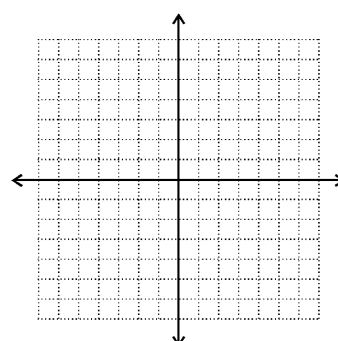
Objective 11: Graph linear equations.

Graph each line on the coordinate plane provided. Show all work necessary to graph the line.

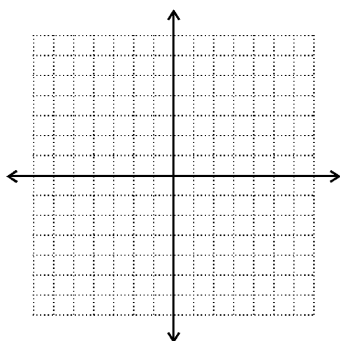
64. $x = 5$



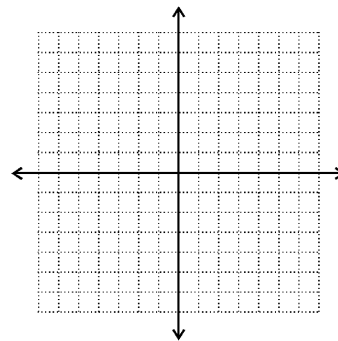
65. $3y = 12$



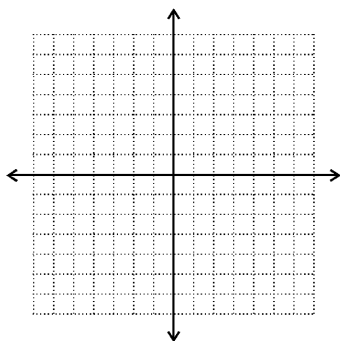
66. $y = \frac{1}{5}x - 5$



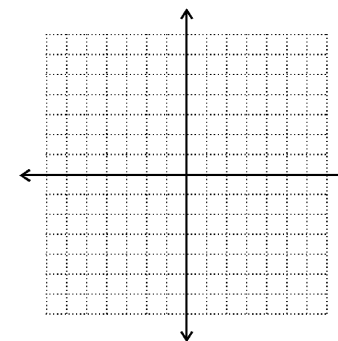
67. $y = -3x$



68. $4x - y = -2$



69. $3x - 8y + 24 = 0$



Objective 12: Write the equation of a line.

Write the equation of the line in slope-intercept form. Show all work and circle your answer.

70. slope = -2, y-intercept (0, -7)

71. slope = -4, passing through (-2,-5)

72. x-intercept (-3,0), y-intercept (0,9)

73. passing through (6,-5) and (-2,7)

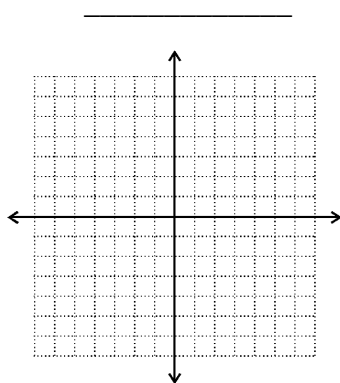
74. parallel to $2x - 3y = 6$ and passing through (-2,5)

75. perpendicular to $y = -2x + 6$ and passing through (-4,2)

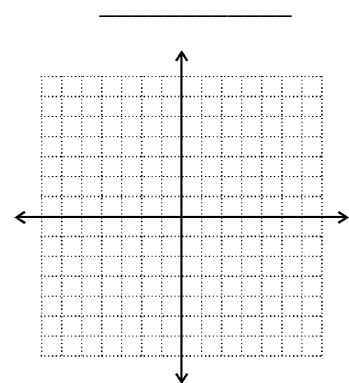
Objective 13: Solve systems of equations.

Solve by graphing on the coordinate plane provided. Show all work. Put your answer in the blank.

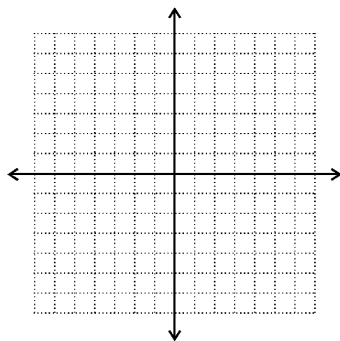
76. $x + 6 = 0$
 $4y + 12 = 0$



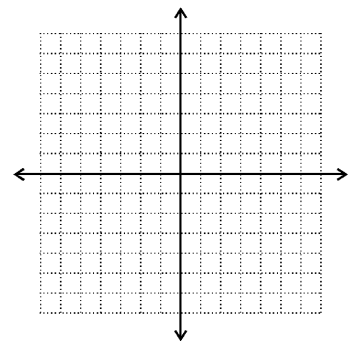
77. $3x - 3y = 0$
 $5x - 5y = 0$



78. $y = \frac{3}{2}x - 9$
 $x - 5y - 6 = 0$



79. $-2x + 10y - 2 = 0$
 $x - 5y + 2 = 0$



Solve by substitution. Show all work and circle your answer.

$$80. \begin{cases} x + y = 0 \\ x - y = -14 \end{cases}$$

$$81. \begin{cases} 2x + 3y = 20 \\ 6x - y = 20 \end{cases}$$

$$82. \begin{cases} 2x - y = 5 \\ -2x + y = 7 \end{cases}$$

$$83. \begin{cases} x + 3y - 5 = 0 \\ 2x + 6y - 10 = 0 \end{cases}$$

Solve by elimination (linear combination). Show all work and circle your answer.

$$84. \begin{cases} y - x = -3 \\ y + x = -3 \end{cases}$$

$$85. \begin{cases} 12x - 10y = 0 \\ -6x + 5y = 2 \end{cases}$$

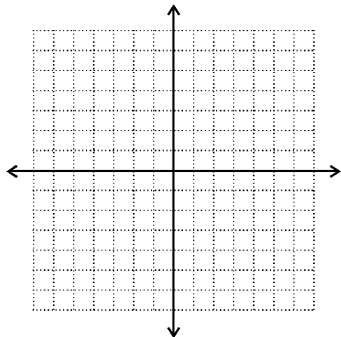
$$86. \begin{cases} 4x - 6y = 20 \\ 2x - 3y = 10 \end{cases}$$

$$87. \begin{cases} 2x - 3y - 35 = 0 \\ 9x + 4y = 0 \end{cases}$$

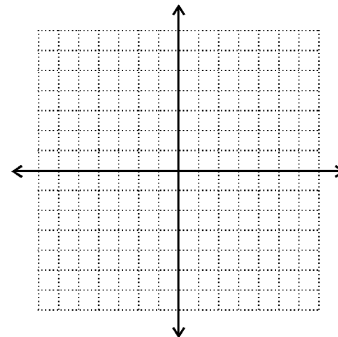
Objective 14: Graph systems of linear inequalities.

Graph the system of linear inequalities on the coordinate plane. Show all work.

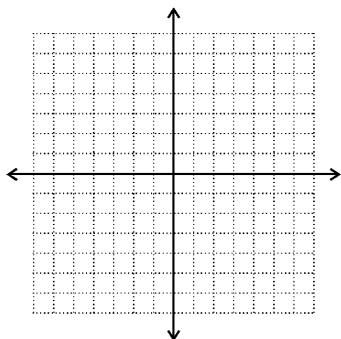
88. $x < 5$
 $y \geq 2$



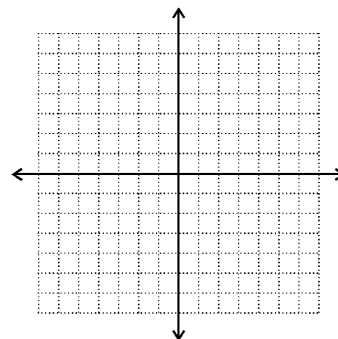
89. $x - 3y < 0$
 $y \geq -x + 4$



90. $y < -2x$
 $y > -2x + 3$



91. $y \geq -1$
 $x + y < 3$

**Objective 15: Simplify exponential expressions.**

Simplify. Show all work and circle your answer.

92. $d^2 d^4$

93. $(-a)^2 (-a)^3$

94. $(9y^4)^2$

95. $(-3r^4 t)^3 \cdot 2rt^4$

96. $\frac{3}{3^4}$

97. $\frac{wz^9}{z^{12}}$

98. $\frac{a^{10} b^2}{a^4 b^9}$

99. $\left(-\frac{mr^4}{p^2}\right)^5$

100. $\frac{(xy^3)^2}{xy}$

101. $\frac{(w^2 z^4)^3}{(-wz^5)^2 (w^4 z^2)}$

Objective 16: Factor quadratic expressions.

Factor completely. Show all work and circle your answer.

102. $3x^2y - 12xy$

103. $x^2 - 3x - 28$

104. $3x^2 - 8x + 5$

105. $2x^2 + 13x + 21$

106. $6x^2 - 7x - 10$

107. $x^2 - 49$

108. $x^2 + y^2$

109. $x^3 - 25x$

110. $x^2 - 6x + 8$

111. $6x^2 - 30x + 24$

Objective 17: Solve quadratic equations.

Solve by factoring. Show all work and circle your answer.

112. $4x^2 - 2x = 0$

113. $x^2 - 3x - 10 = 0$

114. $x^2 + 10x + 21 = 0$

115. $3x^2 - 90x - 192 = 0$

116. $x^2 - 25 = 0$

117. $8x^2 - 16x + 8 = 0$

118. $2x^2 + 7x + 5 = 0$

119. $10x^2 + 23x - 5 = 0$

Solve by using the quadratic formula. Show all work and circle your answer.

120. $x^2 - 4x + 3 = 0$

121. $6x^2 - x - 2 = 0$

122. $15x^2 - 1 = 2x$

123. $5x^2 + x = 5$

124. $x^2 + 6x + 1 = 0$

125. $5x^2 - 10x + 3 = 0$

ANSWERS

1.

	Integer	Rational	Irrational	Real	Natural	Whole
a. 5	X	X		X	X	X
b. $\sqrt{.25}$		X		X		
c. -7	X	X		X		
d. $\sqrt{3}$			X	X		
e. $\sqrt{16}$	X	X		X	X	X
f. 0	X	X		X		X
g. π			X	X		
h. 1.765		X		X		
i. $-\frac{17}{5}$		X		X		
j. $-\sqrt{6}$			X	X		

2. $2 + x$

3. $3x + 15$

4. $4x + 17$

5. $-6x + 32$

6. $-16x - 6$

7. $-x$

8. C

9. I

10. B

11. F

12. K

13. J

14. E

15. A

16. G

17. H

18. 120

19. 6

20. -50

21. -16

22. -80

23. -16

24. $x = -\frac{5}{4}$

25. no solution

26. $x = 30$

27. all real numbers

28. $x = -c$

29. $x = \frac{pd}{2t}$

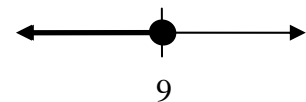
30. $x = \frac{-c}{a-d}$ or $x = \frac{c}{d-a}$

31. $x = -2$ or $x = \frac{-32}{3}$

32. $x = -30$ or $x = 70$

33. $x = 2$ or $x = \frac{-5}{2}$

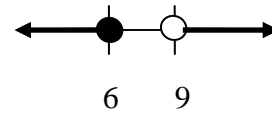
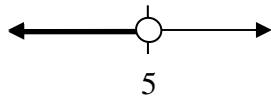
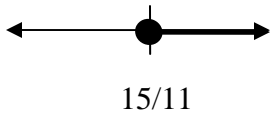
34. $x \leq 9$



35. $x \geq \frac{15}{11}$

36. $x < 5$

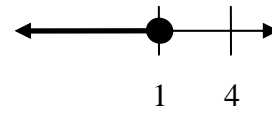
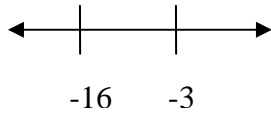
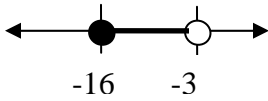
37. $x \leq 6$ or $x > 9$



38. $-16 \leq x < -3$

39. no solution

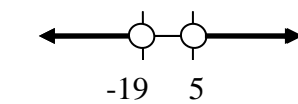
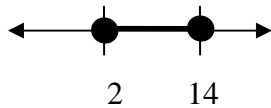
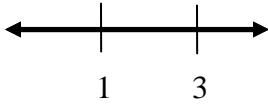
40. $x \leq 1$



41. all real numbers

42. $2 \leq x \leq 14$

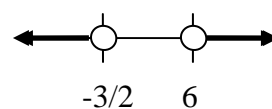
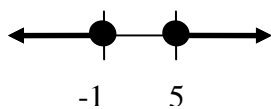
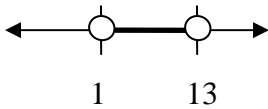
43. $x < -19$ or $x > 5$



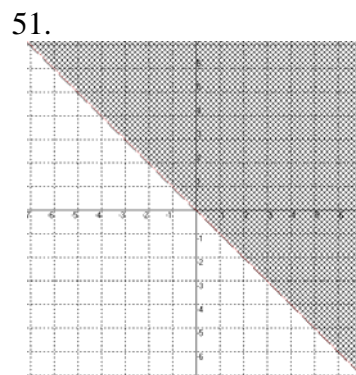
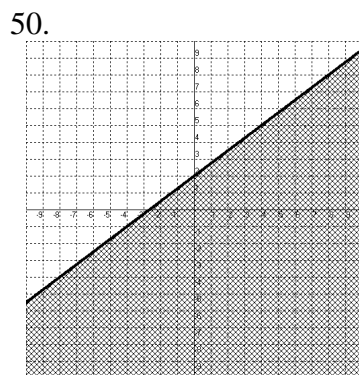
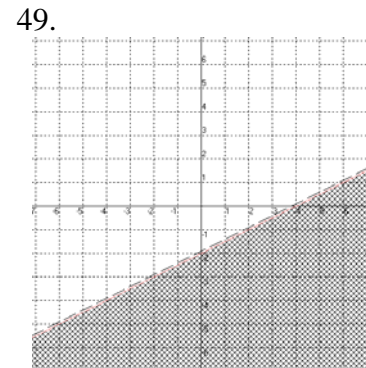
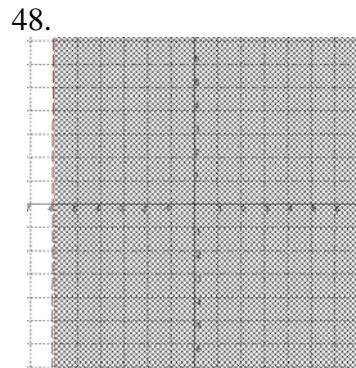
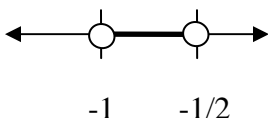
44. $1 < x < 13$

45. $x \leq -1$ or $x \geq 5$

46. $x < -\frac{3}{2}$ or $x > 6$



47. $-1 < x < -\frac{1}{2}$



52. $-\frac{4}{7}$

53. 0

54. undefined

55. undefined

56. $\frac{3}{5}$

57. 0

58. 5

59. $-\frac{5}{3}$

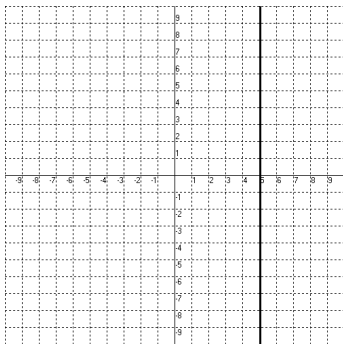
60. $(-2,0), (0,5)$

61. $(-\frac{3}{2},0), (0,3)$

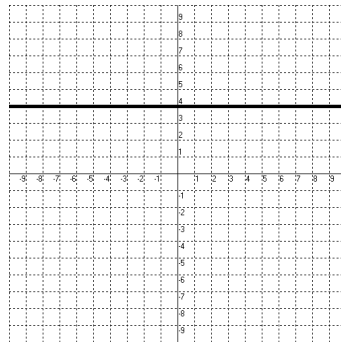
62. $(3,0)$, no y-intercept

63. $(0,-7)$, no x-intercept

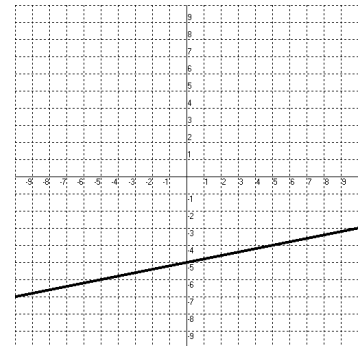
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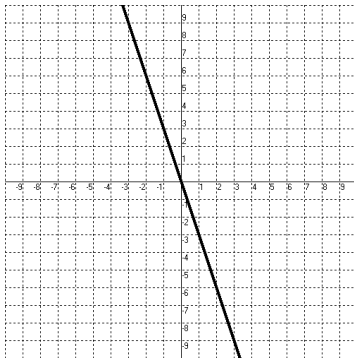
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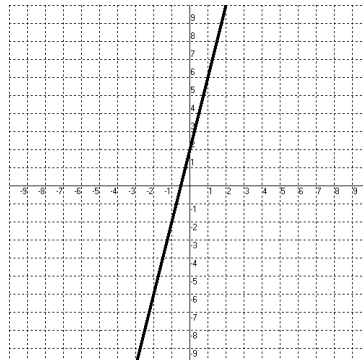
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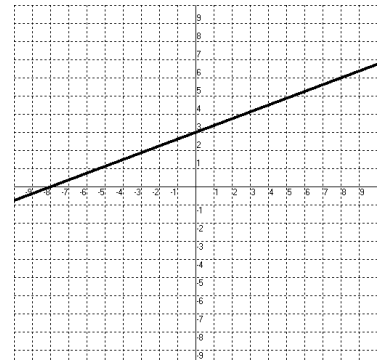
67.



68.



69.



70. $y = -2x - 7$

71. $y = -4x - 13$

72. $y = 3x + 9$

73. $y = -\frac{3}{2}x + 4$

74. $y = \frac{2}{3}x + \frac{19}{3}$

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

76. $(-6, -3)$

77. all points on the line $3x - 3y = 0$

78. $(6, 0)$

79. no solution

80. $(-7, 7)$

81. $(4, 4)$

82. no solution

83. all points on the line $x + 3y - 5 = 0$

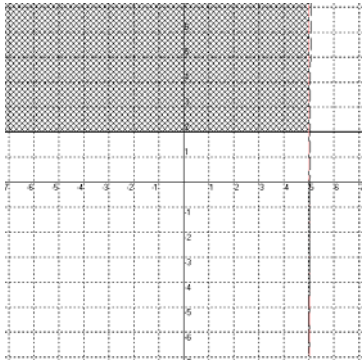
84. $(0, -3)$

85. no solution

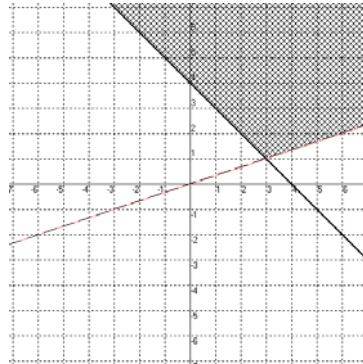
86. all points on the line $4x - 6y = 20$

87. $(4, -9)$

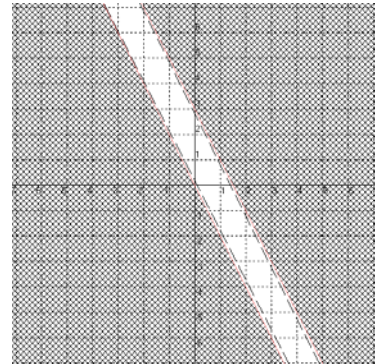
88.



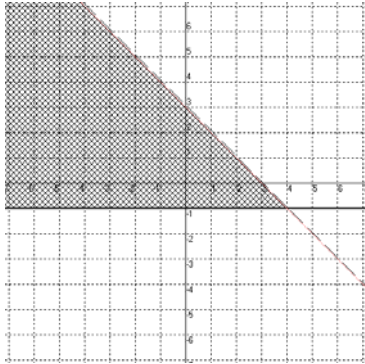
89.



90. no solution



91.

92. d^6 94. $81y^8$ 96. $\frac{1}{27}$ 98. $\frac{a^6}{b^7}$ 93. $-a^5$ 95. $-54r^{13}t^7$ 97. $\frac{w}{z^3}$ 99. $-\frac{m^5r^{20}}{p^{10}}$ 100. xy^5 103. $(x-7)(x+4)$ 106. $(6x+5)(x-2)$ 109. $x(x-5)(x+5)$ 112. $\left\{0, \frac{1}{2}\right\}$ 115. $\{32, -2\}$ 118. $\left\{-\frac{5}{2}, -1\right\}$ 121. $\left\{\frac{2}{3}, -\frac{1}{2}\right\}$ 124. $\{-3 \pm 2\sqrt{2}\}$

101. 1

104. $(3x-5)(x-1)$ 107. $(x-7)(x+7)$ 110. $(x-4)(x-2)$ 113. $\{5, -2\}$ 116. $\{-5, 5\}$ 119. $\left\{-\frac{5}{2}, \frac{1}{5}\right\}$ 122. $\left\{\frac{1}{3}, -\frac{1}{5}\right\}$ 125. $\left\{\frac{5 \pm \sqrt{10}}{5}\right\}$ 102. $3xy(x-4)$ 105. $(2x+7)(x+3)$

108. cannot factor

111. $6(x-4)(x-1)$ 114. $\{-7, -3\}$ 117. $\{1\}$ 120. $\{3, 1\}$ 123. $\left\{\frac{-1 \pm \sqrt{101}}{10}\right\}$