

Honors Algebra II

2009 Summer Assignment

Dear student,

Welcome to Honors Algebra II! You have signed up for a rigorous course that will challenge your minds to think harder and dig a little deeper. In preparation for the fall, this summer assignment needs to be completed and even more importantly, the concepts presented in this packet need to be understood when you come in the first day of class. Below are some directions explaining how to complete the assignment, the due date of the assignment, and how the assignment will be graded. We are not trying to scare you, just prepare you for the course you chose to take. Good luck with the assignment and enjoy your summer. We look forward to meeting you in the fall.

Sincerely,
Honors Algebra II Team
June, 2009

Directions:

- Be sure to pay attention to the directions at the start of each section. DO NOT just begin solving.
- Where it is noted to SHOW ALL WORK we mean it.
NO WORK = ABSOLUTELY NO CREDIT
- **Packet is due the first day of class, i.e. the first time you see your teacher!!!**
 - Freshman who have Honors Algebra II **DUE AUG. 24TH**
 - Non-freshman who have Honors Algebra II A-day **DUE AUG. 25TH**
 - Non-freshman who have Honors Algebra II B-day **DUE AUG. 26TH**
- **LATE PAPERS WILL NOT BE ACCEPTED!!!!!!!**
- This will count as a 30 point homework grade, based on completion and accuracy. The accuracy component will not be for the entire packet, but rather selected problems chosen by the teacher.

I. Solving Equations. Solve for x . SHOW ALL WORK!!!!!!

1. $3x + 2 = 23$

2. $5x - 3 = 67$

3. $\frac{x}{2} - 6 = 9$

4. $-6x + 13 = -29$

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

6. $3x - 8 = -15$

7. $6n + 2 = 3n + 26$

8. $2 + 5x = 7x - 16$

9. $4x - 1 = 2x + 28$

10. $\frac{1}{4}x + \frac{1}{2} = \frac{3}{4}x + \frac{1}{3}$

11. $-7x + 3 = 5x + 51$

12. $3(x - 4) = 15$

13. $\frac{7}{2}x - 1 = 2x + 5$

14. $7(x + 2) = 3(x - 2)$

15. $2(x + 6) = -2(x - 4)$

16. $3.1(x + 2) - 1.5x = 5.2(x - 4)$

II. Equations of a line. SHOW ALL WORK!!!!

Write the equation of a line in the slope-intercept form given the following information:

17. m (slope) = $\frac{1}{2}$ and b (y-intercept) = 7

18. $m = -2$ and $b = -3$

19. $m = -\frac{5}{2}$ and $b = -\frac{7}{2}$

20. (0, 3) and (2, -1)

21. (4, 2) and (-2, -4)

22. (-3, -1) and (6, -4)

23. $m = 3$ and (5, -2)

24. $m = -2$ and (3, 0)

25. Write the equation of a horizontal line that passes through line the point (6, 2).

26. Write the equation of a vertical line that passes through line the point (-2, -2).

27.

x	0	1	2	3
y	1	5	9	13

x	2	4	6	8
y	8	6	4	2

28.

29.

x	3	4	5	6
y	5.30	5.40	5.50	5.60

30.

x	-3	-2
y	-4	-8

31. Write the equation of a line that passes through the point $(-1, -2)$ and is parallel to the graph of $y = -3x - 2$.

32. Write the equation of a line that passes through the point $(4, -1)$ and is perpendicular to the graph of $7x - 2y = 3$.

33. Given: $5x + 2y = 2$

a. Write an equation of a line parallel to the given equation.

b. Write an equation of a line perpendicular to the given equation.

c. Write an equation of a line intersecting to the given equation.

Rewrite the equation in the standard form $(ax + by = c)$

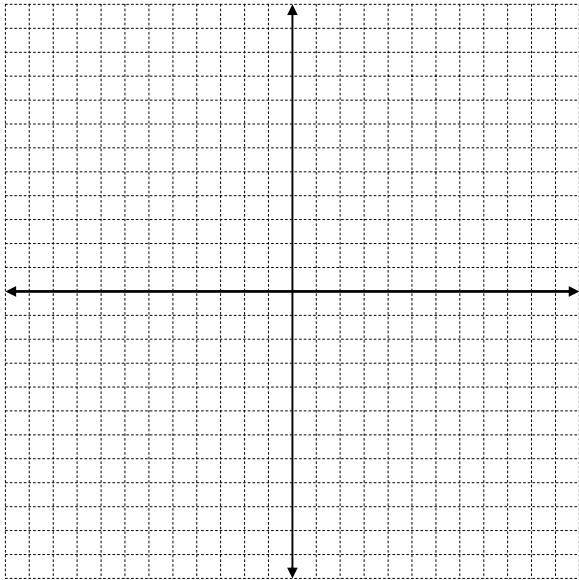
34. $y - 5 = 4(x + 2)$

35. $y - 3 = 2.5(x + 1)$

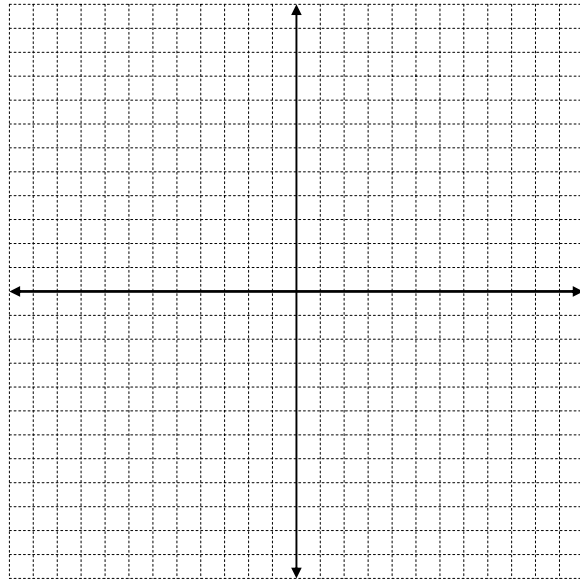
36. $y + 3 = -\frac{3}{4}(x - 1)$

III. Graph the following lines using m (slope) and b (y-intercept). SHOW ALL WORK!!!
(i.e. $m = \underline{\hspace{1cm}}$, $b = \underline{\hspace{1cm}}$)

37. $y = -\frac{1}{3}x + 5$

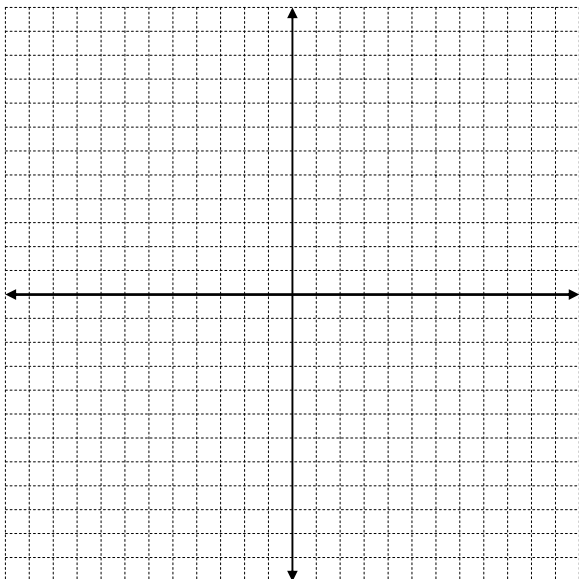


38. $y = 2x - 3$

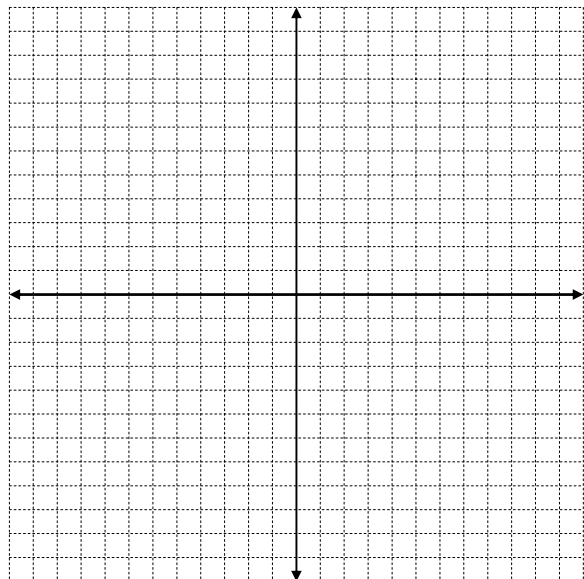


Graph the following lines using the x-intercept and the y-intercept. SHOW ALL WORK!!!!!!

39. $2x + 3y = 6$

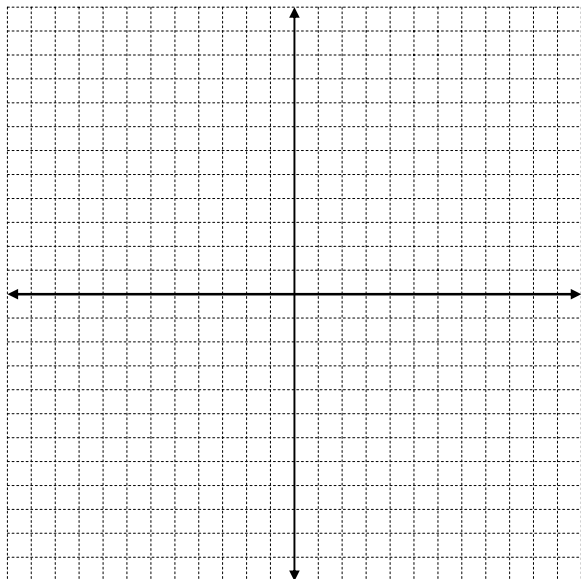


40. $2x - 4y = 8$

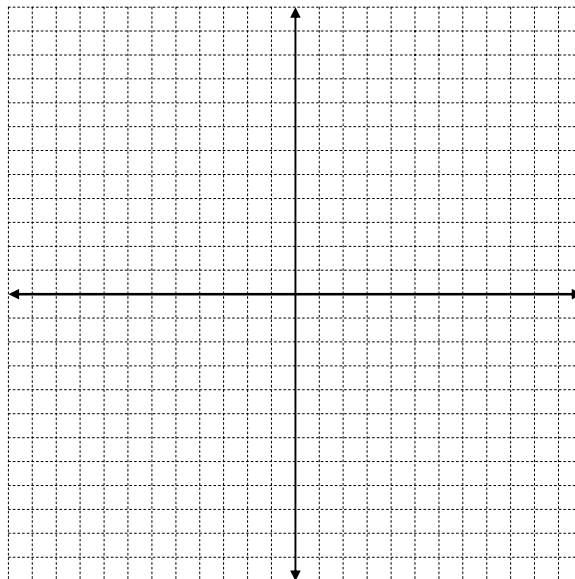


Graph the following lines.

41. $y = 3$



42. $x = -4$



IV. Linear Regression.

Find a linear regression model using the calculator.

43. **Space** - Use the table that shows the amount that the United States government has spent on space and other technologies in the selected years. Use $x = 0$ as 1980.

Year	1980	1985	1990	1995	1996	1997	1998	1999
Spending (Billions of \$)	4.5	6.6	11.6	12.6	12.7	13.1	12.9	12.4

- Write an equation of the line of best fit (round parts to hundredths).
- Using $x = 0$ as 1980, predict the spending for 2006.
- Explain the meaning of the slope for this situation.

d. Give the correlation coefficient and determine how well the model fits the data.

44. Use the table that shows the length and width of several humpback whales.

Length (ft.)	40	42	45	46	50	52	55
Weight (long tons)	25	29	34	35	43	45	51

a. Write an equation of the line of best fit (round parts to hundredths).

b. Predict the length of a whale whose weight is 40 long tons.

c. Predict the weight of a whale whose length is 60 feet.

d. Give the correlation coefficient and determine how well the model fits the data.

45. **Birds** - The table shows an estimate for the numbers of bald eagle pairs in the United States for certain years since 1985.

Yrs since 1985	3	5	7	9	11	14
Bald Eagle Pairs	2500	3000	3700	4500	5000	5800

a. Write an equation of the line of best fit (round parts to hundredths).

b. Predict the number of bald eagle pairs in 2006.

c. Explain the meaning of the y - intercept for this situation..

d. Give the correlation coefficient and determine how well the model fits the data.

V. Systems. Solve each system of equations algebraically. (Use substitution or elimination) **SHOW ALL WORK!!!!!!**

$$\begin{aligned} 46. \quad 2x + y &= -4 \\ 5x + 3y &= -6 \end{aligned}$$

$$\begin{aligned} 47. \quad y &= x + 2 \\ y &= 2x + 7 \end{aligned}$$

$$\begin{aligned} 48. \quad y &= 7 - x \\ x - y &= -3 \end{aligned}$$

$$\begin{aligned} 50. \quad x + 2y &= 11 \\ x + 2y &= 14 \end{aligned}$$

$$\begin{aligned} 51. \quad 5x - 3y &= 12 \\ 2x + 3y &= -3 \end{aligned}$$

$$\begin{aligned} 52. \quad 3x + y &= 5 \\ 6x + 2y &= 10 \end{aligned}$$

Graph each system to solve. (Use calculator) Provide an explanation of how you determine the solution to a system graphically in the box provided.

$$\begin{aligned} 53. \quad y &= x - 1 \\ y &= 4x - 19 \end{aligned}$$

$$\begin{aligned} 54. \quad y - 3x &= 8 \\ 9x + 2 &= 3y \end{aligned}$$

$$\begin{aligned} 55. \quad 3x + y &= -4 \\ y &= \frac{-8 - 6x}{2} \end{aligned}$$

$$\begin{aligned} 56. \quad 2x + 3y &= 1 \\ 4x - 5y &= 13 \end{aligned}$$

VI. Polynomials. SHOW ALL WORK!!!!!!

Simplify:

Problem	Answer
57. $(4x^2 - 11x + 10) + (5x - 31)$	
58. $(-3x^3 + x - 11) - (4x^3 + x^2 - x)$	
59. $5x(3x^2 - x + 3)$	
60. $-4x(x^2 - 8x + 3)$	

61. $(x-1)(x^3+2x^2+2)$	
62. $(x-1)(2x+1)$	
63. $(x+2)(2x^2+3)$	
64. $(x+3y)(2x-y)$	
65. $(4x-1)(2x-1)$	

Simplify:

Problem	Answer
66. $(x-5)^2$	
67. $(2x^2+3)^2$	
68. $(4x-1)^2$	
69. $(x+3)^2$	

Factor:

Problem	Answer
70. $3x^4-12x^3$	
71. $6x^4-18x^3+15x^2$	
72. x^3-2x^2-4x+8	

73. $x^3 + 3x^2 + 10x + 30$	
74. $3x^2 - 5x + 2$	
75. $x^2 - 9x + 18$	
76. $4x^2 - 11x + 6$	
77. $5x^2 - 35x + 60$	
78. $25x^2 - 16$	

VII. Simplify (leave a $\sqrt{\quad}$ in the answer for irrational numbers if necessary-don't estimate). SHOW ALL WORK!!!!

79. $\sqrt{100}$ _____ 80. $-\sqrt{1}$ _____ 81. $\sqrt{98}$ _____

82. $\sqrt{75}$ _____ 83. $\sqrt{\frac{36}{81}}$ _____ 84. $\sqrt{\frac{25}{49}}$ _____

85. $\frac{\sqrt{18}}{\sqrt{2}}$ _____ 86. $\sqrt{\frac{7}{3}}$ _____ 87. $\sqrt{\frac{8}{5}}$ _____

88. $\sqrt{\frac{1}{12}}$ _____ 89. $2\sqrt{2} + 3\sqrt{2}$ _____

90. $\sqrt{3} - 7\sqrt{3}$ _____ 91. $4\sqrt{2} + \sqrt{18}$ _____

92. $2\sqrt{5} - 3\sqrt{45}$ _____

93. $\sqrt{175} + \sqrt{63} + \sqrt{112}$ _____

94. $\sqrt{12} - \sqrt{108} + \sqrt{75}$ _____

95. $\sqrt{5} \cdot \sqrt{3}$ _____

96. $(\sqrt{27})(\sqrt{3})$ _____

97. $(-2\sqrt{8})(4\sqrt{2})$ _____

98. $(\sqrt{15})(\sqrt{5})$ _____

VIII. Absolute Value Inequalities**Graph on a number line.**

99. $-10 < x < 3$

100. $x \geq 8$ or $x \leq -2$

101. $x \geq 7$ or $x < 3$

102. $x < 4$ or $x > 9$

103. $-1 \leq x < 5$

104. $-12 \leq x \leq 1$

Solve.

105. $|x + 9| > 15$

106. $|x - 4| \leq 5$

107. $|7x + 3| \geq 17$

108. $\left|10 + \frac{1}{3}x\right| < 20$