

Honors Geometry Algebra Review

This assignment should be completed without the use of a calculator – Except where specified. Leave all answers in simplified radical form or improper fractions (no decimals). Answers are also found below so you can check your work.

Solve.

1. $\frac{2}{3} + x = -\frac{5}{2} - \frac{5}{6}$

2. $\frac{1}{2}x + \frac{3}{2}x = x + \frac{9}{2} - \frac{1}{2}x$

3. $\frac{3}{2}x + \frac{1}{5}x = \frac{11}{6}x - \frac{2}{15}$

Solve each equation for the indicated variable.

4. $A = \frac{bh}{2}$, for b

5. $A = \pi r^2$, for r

6. $P = 2w + 2l$, for w .

7. $V = \frac{4\pi r^3}{3}$, for r

8. $A = \frac{(b_1 + b_2)h}{2}$, for b_1

9. $d = \sqrt{x^2 + y^2}$, for y

Solve.

10. $\frac{27}{4} = \frac{m}{4}$

11. $\frac{x}{4} = \frac{9}{x}$

12. $\frac{7}{2} = \frac{a+3}{5}$

13. $\frac{4x-2}{3} = \frac{2x}{7}$

14. $\frac{x-2}{3} = \frac{2x+8}{6x}$

Solve.

15. $7+8y > 2y-12$

16. $5-4y < 37$

17. $6m-14 > 18-10m$

Simplify the following expressions.

18. $\frac{7^5}{7^3}$

19. $\left(\frac{4}{3}\right)^{-2}$

20. $(x^4y^3)(x^5y)$

21. $(-2x^5y^6)^3$

22. $\frac{3a^2x^3}{18a^4x^2}$

23. $\left(\frac{12a^4x^3}{18a^4x^7}\right)$

Multiply.

24. $(x+5)(x-3)$

25. $(2x-5)(3x-7)$

26. $(x-4)(x+4)$

27. $(2x-6)(2x+6)$

28. $(x+9)^2$

29. $(4x-11)^2$

Factor (#30-38) and Solve (#39-47).

30. $x^2 - 49$

31. $x^2 - 64$

32. $x^2 - 1$

33. $4a^2 - 36$

34. $144y^2 - 100$

35. $16n^2 - 81$

36. $x^2 + 8x + 16$

37. $a^2 + 10a + 25$

38. $n^2 - 2n + 1$

39. $x^2 - 14x + 49 = 0$

40. $16x^2 + 24x + 9 = 0$

41. $25x^2 - 60x + 36 = 0$

42. $x^2 + 2x - 35 = 0$

43. $x^2 + 20x + 64 = 0$

44. $x^2 + 8x - 48 = 0$

45. $2x^2 - 12x + 10 = 0$

46. $3x^2 + 26x + 16 = 0$

47. $6x^2 - 12x - 18 = 0$

Simplify each radical expression. * Leave your answers in simplest radical form!!!* (This means no decimals and no radicals in any denominators)

48. $\sqrt{27}$

49. $\sqrt{48}$

50. $\sqrt{80}$

51. $\sqrt{18}$

52. $\sqrt{250}$

53. $\sqrt{\frac{9}{16}}$

54. $\sqrt{\frac{9}{32}}$

55. $\frac{\sqrt{3}}{\sqrt{5}}$

56. $\frac{6}{\sqrt{3}}$

57. $\sqrt{\frac{1}{8}}$

58. $10\sqrt{5} + 3\sqrt{5}$

59. $\sqrt{80} - \sqrt{45}$

60. $(3\sqrt{3})(7\sqrt{6})$

61. $(\sqrt{3})(\sqrt{6})$

Solve by completing the square.

62. $x^2 + 8x - 17 = 0$

63. $x^2 - 4x - 16 = 0$

64. $x^2 + 10x + 18 = 0$

Solve by the quadratic formula.

65. $3x^2 + 8x + 2 = 0$

66. $5x^2 + 3x - 16 = 0$

67. $3x^2 + 8x + 10 = 0$

For each of the following equations or inequalities:

a) identify the slope

b) identify the x- and y-intercept

c) graph

68. $y = x - 2$

69. $2x + 4 = y$

70. $5y + 2x = 10$

71. $2y + 4x = 14$

72. $3y - 4x = 9$

73. $x = 4$

74. $y = -5$

75. $y \geq 3x + 1$

76. $4y < 6x - 8$

77. $2y - 3x \leq 12$

78. $3x - 6y > 36$

Find the slope of the line that passes through the following points.

79. (6, 8) & (-2, -4)

80. (-3, 0) & (-3, 5)

81. (5, 1) & (-1, 1)

82. (3, 4) & (5, -8)

Write the slope-intercept form of the equation of each line.

83. $3x - 2y = -16$

84. $13x - 11y = -12$

85. $6x + 5y = -15$

Find the equation of the line through the given point with given slope. Write the answer in slope-intercept form.

86. through (1, 2); $m = 7$

87. through (3, 1); $m = -1$

88. through (-2, 5); $m = -4$

89. through (2, 1); undefined slope

90. through (6, -2); $m = 0$

parallel lines have the same slope

perpendicular lines have opposite sign reciprocal

Write the equation of a line in point-slope form with the given conditions. ex $m = -\frac{2}{3}$ perpendicular slope = $+\frac{3}{2}$

91. Parallel to $y = 2x - 10$ and passes through $(4, 2)$.

92. Perpendicular to $y = \frac{2}{3}x + 8$ and passes through $(-3, 7)$

93. Parallel to $y = \frac{9}{7}x - 11$ and passes through $(0, -4)$

94. Perpendicular to $2y - 10 = -x$ and passes through the point $(-5, -1)$

Solve each system by graphing. You must use the graphing calculator in order to complete these problems. Reminder, write answers as improper fractions (where necessary).

95. $y = -3x + 5$
 $y = 2x + 10$

96. $x + y = 6$
 $x - y = 4$

97. $x + y = 3$
 $2x - y = 2$

Solve each system by either substitution or elimination method.

98. $y = 7x + 5$
 $y = 4x - 10$

99. $5x + 2y = 22$
 $x + 2y = 14$

100. $2x + 5y = 2$
 $3x - 2y = 3$

101. $x - y = 9$
 $3x + y = 11$

102. $y = 7 - 2x$
 $5y = -3x + 7$

103. $6x + 3y = 0$
 $8x + 5y = 8$

104. $x = 8 + 3y$
 $2x - 5y = 8$

105. $3x + 2y = 71$
 $y = 4 + 2x$

Honors Geometry Algebra Review Answers

1) $x = -4$

2) $x = 3$

3) $x = 1$

4) $b = \frac{2A}{h}$

5) $r = \pm \sqrt{\frac{A}{\pi}}$

6) $w = \frac{P-2l}{2}$

7) $r = \sqrt[3]{\frac{3V}{4\pi}}$

8) $b_1 = \frac{2A}{h} - b_2$

9) $y = \pm \sqrt{a^2 - x^2}$

10) $m = 27$

11) $x = \pm 6$

12) $a = \frac{29}{2}$

13) $x = \frac{7}{11}$

14) $x = 4, x = -1$

15) $y > \frac{-19}{6}$

16) $y > -8$

17) $m > 2$

18) 49

19) $\frac{9}{16}$

20) $x^9 y^4$

21) $-8x^{15} y^{18}$

22) $\frac{x}{6a^2}$

23) $\frac{2}{3x^4}$

24) $x^2 + 2x - 15$

25) $6x^2 - 29x + 35$

26) $x^2 - 16$

27) $4x^2 - 36$

28) $x^2 + 18x + 81$

29) $16x^2 - 88x + 121$

30) $(x-7)(x+7)$

31) $(x-8)(x+8)$

32) $(x-1)(x+1)$

33) $4(a-3)(a+3)$

34) $4(6y-5)(6y+5)$

35) $(4n-9)(4n+9)$

36) $(x+4)^2$

37) $(a+5)^2$

38) $(n-1)^2$

39) $x = 7$

40) $x = \frac{-3}{4}$

41) $x = \frac{6}{5}$

42) $x = -7, x = 5$

43) $x = -16, x = -4$

44) $x = -12, x = 4$

45) $x = 5, x = 1$

46) $x = \frac{-2}{3}, x = -8$

47) $x = 3, x = -1$

48) $3\sqrt{3}$

49) $4\sqrt{3}$

50) $4\sqrt{5}$

51) $3\sqrt{2}$

52) $5\sqrt{10}$

53) $\frac{3}{4}$

54) $\frac{3\sqrt{2}}{8}$

55) $\frac{\sqrt{15}}{5}$

56) $2\sqrt{3}$

Honors Geometry Algebra Review Answers

$$57) \frac{\sqrt{2}}{4}$$

$$58) 13\sqrt{5}$$

$$59) \sqrt{5}$$

$$60) 63\sqrt{2}$$

$$61) 3\sqrt{2}$$

$$62) x = -4 \pm \sqrt{33}$$

$$63) x = 2 \pm 2\sqrt{5}$$

$$64) x = -5 \pm \sqrt{7}$$

$$65) x = \frac{-4 \pm \sqrt{10}}{3}$$

$$66) x = \frac{-3 \pm \sqrt{329}}{10}$$

$$67) x = \emptyset \text{ (no solutions)}$$

For the problems #68-78 the graphs are on the following pages.

$$68) m = 1; (2,0) (0,-2)$$

$$69) m = 2; (-2,0) (0,4)$$

$$70) m = \frac{-2}{5}; (5,0) (0,2)$$

$$71) m = -2; \left(\frac{7}{2}, 0\right) (0, 7)$$

$$72) m = \frac{4}{3}; \left(\frac{-9}{4}, 0\right) (0, 3)$$

$$73) m = \text{no slope}; (4,0) \text{ none}$$

$$74) m = 0; \text{none } (0,-5)$$

$$75) m = 3; \left(\frac{-1}{3}, 0\right) (0,1)$$

$$76) m = \frac{3}{2}; \left(\frac{4}{3}, 0\right) (0,-2)$$

$$77) m = \frac{3}{2}; (-4,0) (0,6)$$

$$78) m = \frac{1}{2}; (12,0) (0,-6)$$

$$79) m = \frac{3}{2}$$

$$80) \text{no slope}$$

$$81) m = 0$$

$$82) m = -6$$

$$83) y = \frac{3}{2}x + 8$$

$$84) y = \frac{13}{11}x + \frac{12}{11}$$

$$85) y = \frac{-6}{5}x - 3$$

$$86) y = 7x - 5$$

$$87) y = -x + 4$$

$$88) y = -4x - 3$$

$$89) x = 2$$

$$90) y = -2$$

$$91) y - 2 = 2(x - 4)$$

$$92) y - 7 = \frac{-3}{2}(x + 3)$$

$$93) y + 4 = \frac{9}{7}(x - 0)$$

$$94) y + 1 = 2(x + 5)$$

$$95) (-1, 8)$$

$$96) (5, 1)$$

$$97) \left(\frac{5}{3}, \frac{4}{3}\right)$$

$$98) (-5, -30)$$

$$99) (2, 5)$$

$$100) (1, 0)$$

$$101) (5, -4)$$

$$102) (4, -1)$$

$$103) (-4, 8)$$

$$104) (-16, -8)$$

$$105) (9, 22)$$

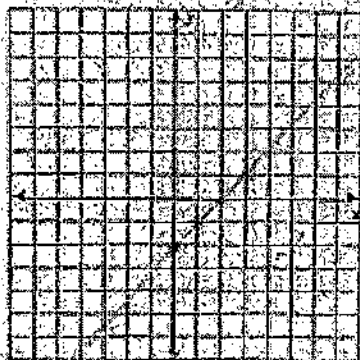
Honors Geometry Algebra Review Answers

Name KEY

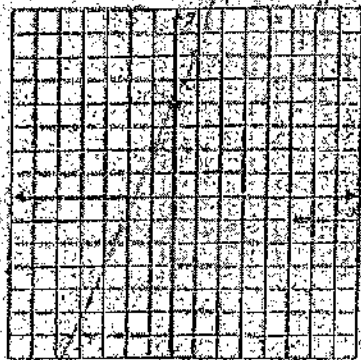
Assignment Graph - Algebra Review

Date

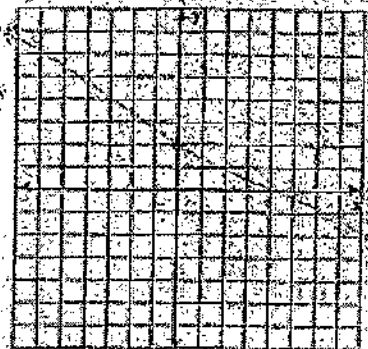
180 $y = x - 2$



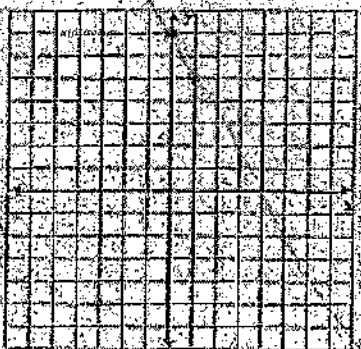
181 $y = 2x - 9$



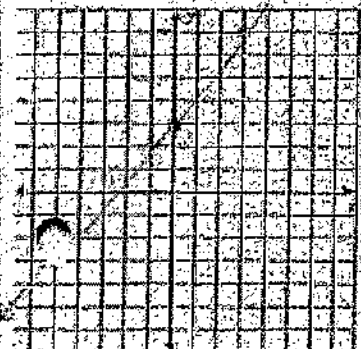
182



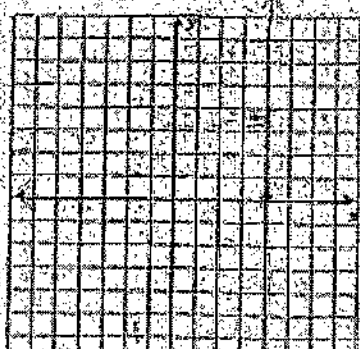
183



184

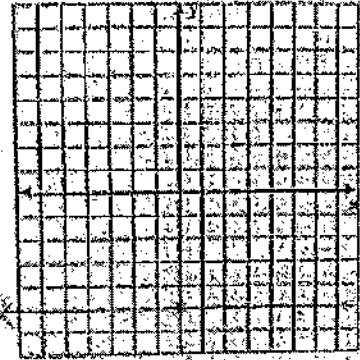


185

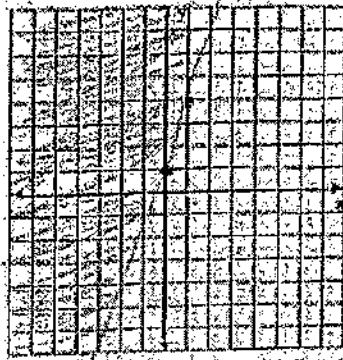


Honors Geometry Algebra Review Answers

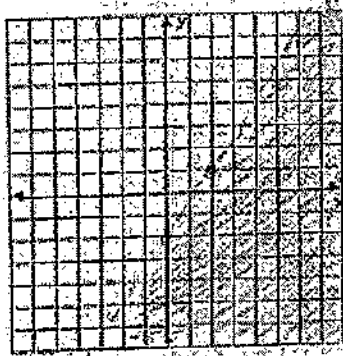
74c



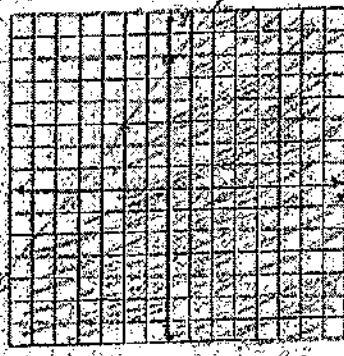
75c



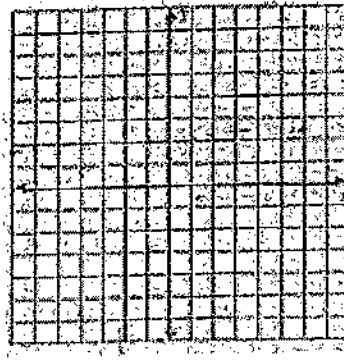
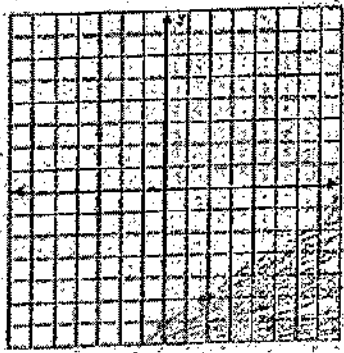
76c



77c



78c



Examples for Honors Geometry Summer Assignment Date _____ Period _____

Solve each equation.

$$\begin{array}{r} 48 \cdot \frac{1}{2}x + 1 + \frac{4}{3} = \frac{67}{48} + \frac{5x}{4} \end{array}$$

$$24x + 48 + 64 = 67 + 60x$$

$$\begin{array}{r} 24x + 112 = 67 + 60x \\ -24x \quad -24x \\ \hline 45 = 36x \end{array}$$

$$\frac{45}{36} = \frac{36x}{36} \quad \frac{112 = 67 + 36x}{-67 \quad -67}$$

Solve each equation for the indicated variable.

$$\frac{5}{4} = x \quad 3) \frac{cx}{d} = \frac{rd}{c}, \text{ for } x$$

$$x = \frac{rd}{c}$$

$$\begin{array}{r} 24 \cdot \frac{7n}{6} - \frac{21}{8} = -\frac{103}{24} + \frac{1}{3}n \end{array}$$

$$\begin{array}{r} 28n - 63 = -103 + 8n \\ -8n \quad +63 \quad +63 \quad -8n \end{array}$$

$$\frac{20n}{20} = \frac{-40}{20}$$

$$n = -2$$

$$4) \frac{a}{c} \cdot \frac{d}{r} = \frac{cd}{r}, \text{ for } a \quad \text{Cross multiply}$$

$$\frac{ar}{r} = \frac{cd}{r}$$

$$a = \frac{cd}{r}$$

Solve each equation. Remember to check for extraneous solutions.

$$\begin{array}{r} 3b \cdot \left(5) \frac{1}{3b} = \frac{1}{3} - \frac{2}{b} \right) \end{array}$$

$$\begin{array}{r} 1 = b - 6 \\ -6 \quad +6 \\ \hline 7 = b \end{array}$$

$$\begin{array}{r} \frac{1}{3} \cdot 3b = b \\ -\frac{2}{b} \cdot 3b = -6 \end{array}$$

$$\begin{array}{r} 2p \cdot \left(6) \frac{3}{2p} + \frac{1}{2} = \frac{6}{p} \right) \end{array}$$

$$\begin{array}{r} 3 + p = \frac{12}{p} \\ -3 \quad -3 \end{array}$$

$$p = 9$$

Solve each inequality.

$$7) -1 + 2p \geq -8 + 4p - 1$$

$$\begin{array}{r} -1 \geq -9 + 2p \\ +9 \quad +9 \end{array}$$

$$\frac{8}{2} \geq \frac{2p}{2}$$

$$4 \geq p$$

$$p \leq 4$$

$$8) 2b - 11 \geq b - 5$$

$$\begin{array}{r} b - 11 \geq -5 \\ +11 \quad +11 \end{array}$$

$$b \geq 6$$

Simplify. Your answer should contain only positive exponents.

$$9) \frac{3^2 \cdot 3^{-4}}{3^3} \cdot \frac{3^{-2}}{3^3} = 3^{-2-3} = 3^{-5} = \frac{1}{3^5}$$

$$10) \frac{4^2}{4^2 \cdot 4^0} = \frac{1}{1} = 1$$

$$11) \frac{2^{-3}}{2^3 \cdot 2^0}$$

$$2^{-3-3} = 2^{-6} = \boxed{\frac{1}{2^6}}$$

$$12) (a^{-3}b^{-1})^4$$

$$\begin{matrix} (-3)(4) & (-1)(4) \\ a & b \\ a^{-12} & b^{-4} \end{matrix} = \boxed{\frac{1}{a^{12}b^4}}$$

$$13) 4yx^{-2} \cdot x^3y^4 \cdot 3y^2$$

$$(4 \cdot 3)(y \cdot y^4 y^2)(x^{-2}x^3)$$

$$\boxed{12y^7x^1}$$

Find each product.

$$14) (4n+7)(5n+4)$$

	4n	7	
5n	20n ²	35n	20n ² + 51n + 28
4	16n	28	

$$15) (-8n+4)(-3n+5)$$

	-8n	+4	
-3n	24n ²	-12n	24n ² - 52n + 20
+5	-40n	+20	

Factor each completely.

$$16) b^2 + 10b + 21$$

$$\boxed{(b+3)(b+7)}$$

$$\begin{matrix} 21 \\ 1+21=22 \\ 3+7=10 \end{matrix}$$

$$17) v^2 + 4v - 5$$

$$\boxed{(v-1)(v+5)}$$

$$\begin{matrix} -5 \\ -1+5=4 \end{matrix}$$

$$18) r^2 + 2r - 35$$

$$\boxed{(r-5)(r+7)}$$

$$\begin{matrix} 35 \\ 35 \\ +5+7=2 \end{matrix}$$

$$19) 6x^2 - 12x - 18$$

$$6(x^2 - 2x - 3)$$

$$6(x+1)(x-3)$$

$$\begin{matrix} 3 \\ +1-3=-2 \end{matrix}$$

$$20) 3x^2 - 19x - 40 \quad (3 \cdot 40)$$

$$(3x^2 - 5x) + (24x - 40)$$

$$x(3x-5) + 8(3x-5)$$

$$\boxed{(x+8)(3x-5)}$$

	120
1	120
2	60
3	40
4	30
5	24

Solve each equation by factoring.

$$21) n^2 - 4n = 0$$

$$n(n-4) = 0$$

$$\boxed{n=0}$$

$$\begin{matrix} n-4=0 \\ +4 \quad +4 \\ \hline n=4 \end{matrix}$$

$$22) n^2 - 6n + 9 = 0$$

$$(n-3)(n-3) = 0$$

$$\begin{matrix} n-3=0 \\ +3 \quad +3 \\ \hline n=3 \end{matrix}$$

$$\begin{matrix} n-3=0 \\ +3 \quad +3 \\ \hline n=3 \end{matrix}$$

Simplify.

$$23) \sqrt{320}$$

$$\swarrow \searrow$$

$$\sqrt{64} \cdot \sqrt{5}$$

$$\boxed{8\sqrt{5}}$$

$$25) \frac{4\sqrt{4}}{5\sqrt{3}} \cdot \frac{4 \cdot 2}{5\sqrt{3}} = \frac{8}{5\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{8\sqrt{3}}{5\sqrt{9}}$$

$$\rightarrow \frac{8\sqrt{3}}{5 \cdot 3} = \boxed{\frac{8\sqrt{3}}{15}}$$

$$27) \frac{\sqrt{5}}{5\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{15}}{5\sqrt{9}} = \frac{\sqrt{15}}{5 \cdot 3} = \boxed{\frac{\sqrt{15}}{15}}$$

$$24) \sqrt{28}$$

$$\swarrow \searrow$$

$$\sqrt{4} \cdot \sqrt{7}$$

$$\boxed{2\sqrt{7}}$$

$$26) 2\sqrt{10} \cdot -2\sqrt{20}$$

$$-4\sqrt{200}$$

$$\swarrow \searrow$$

$$-4 \cdot \sqrt{100} \cdot \sqrt{2}$$

$$-4 \cdot 10\sqrt{2} = \boxed{-40\sqrt{2}}$$

$$28) 3\sqrt{54} - 3\sqrt{6}$$

$$\swarrow \searrow$$

$$9\sqrt{6}$$

$$3 \cdot 3\sqrt{6}$$

$$9\sqrt{6} - 3\sqrt{6} = \boxed{6\sqrt{6}}$$

$$29) 3\sqrt{6} + 3\sqrt{54}$$

$$3\sqrt{6} + 3\sqrt{9} \sqrt{6}$$

$$3\sqrt{6} + 3 \cdot 3\sqrt{6}$$

$$3\sqrt{6} + 9\sqrt{6}$$

$$\boxed{12\sqrt{6}}$$

Solve each equation by completing the square.

$$30) b^2 - 16b - 57 = 0$$

$$\begin{array}{r} 57 \\ \swarrow \searrow \\ -19+3 \end{array}$$

$$(b-19)(b+3) = 0$$

$$b-19=0 \quad b+3=0$$

$$+19+19 \quad -3$$

$$\boxed{b=19} \quad \boxed{b=-3}$$

Find the slope of each line and y-intercept.

$$32) y = \frac{1}{2}x - 4 \quad y = mx + b$$

slope $\rightarrow m = \frac{1}{2}$

$b = -4$

y-intercept

$$31) n^2 + 16n + 48 = 0$$

$$(n+4)(n+12) = 0$$

$$n+4=0 \quad n+12=0$$

$$\begin{array}{r} 48 \\ \swarrow \searrow \\ 2 \quad 24 \\ 3 \quad 16 \\ 4 \quad 12 \end{array}$$

$$\begin{array}{r} n+4=0 \quad n+12=0 \\ -4 \quad -4 \quad -12 \quad -12 \\ \hline \end{array}$$

$$\boxed{n=-4} \quad \boxed{n=-12}$$

$$33) 2x - y = -4$$

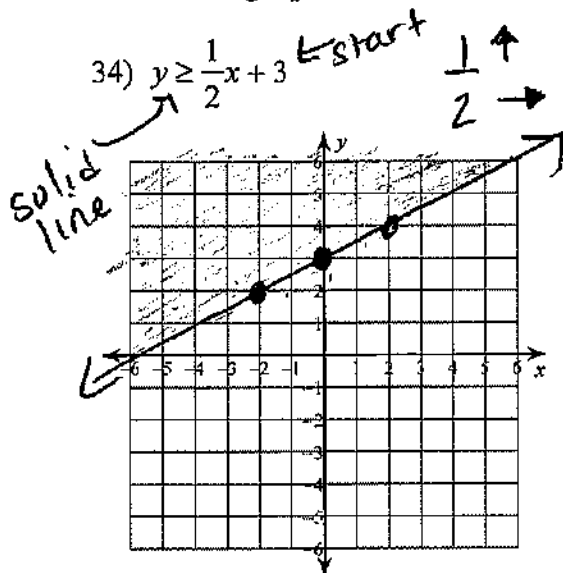
$$-2x \quad -2x$$

$$\begin{array}{r} -y = -2x - 4 \\ -1 \quad -1 \\ \hline \end{array}$$

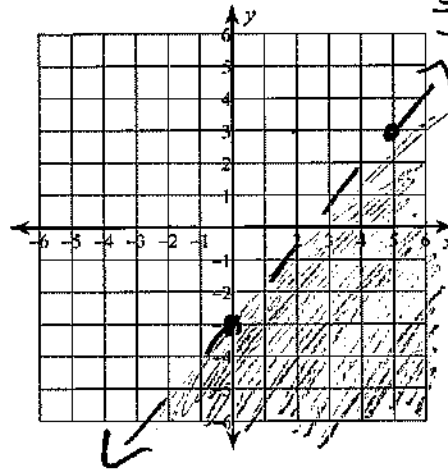
$$y = 2x + 4$$

Sketch the graph of each linear inequality.

34) $y \geq \frac{1}{2}x + 3$



35) $6x - 5y > 15$



$$\begin{array}{r} 6x - 5y > 15 \\ -6x \qquad -6x \\ \hline -5y > -6x + 15 \\ \hline -5 \qquad -5 \qquad -5 \\ y < \frac{6}{5}x - 3 \end{array}$$

divide out
a negative
flip the
inequality
sign

Find the slope of the line through each pair of points.

36) $(7, -5), (13, -20)$

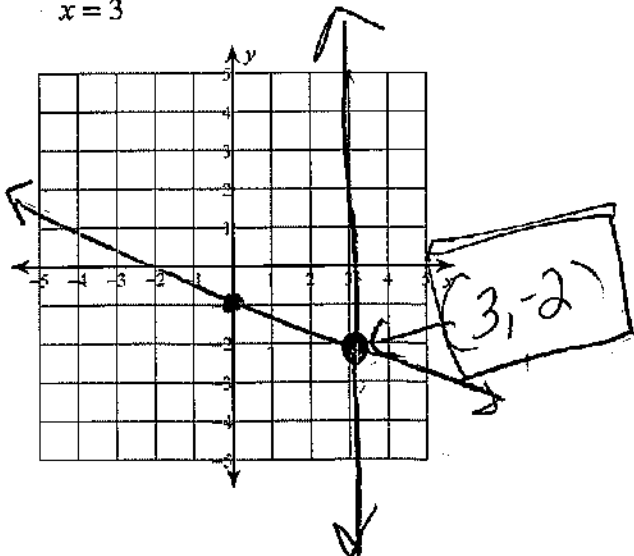
36) $(7, -5), (13, -20)$

$$\begin{array}{l} (7, -5) \\ (13, -20) \end{array} \quad \begin{array}{c} + \\ -5 - (-20) \\ \hline 7 - 13 \end{array} = \frac{+15}{-6} = \boxed{-\frac{5}{2}}$$

Solve each system by graphing.

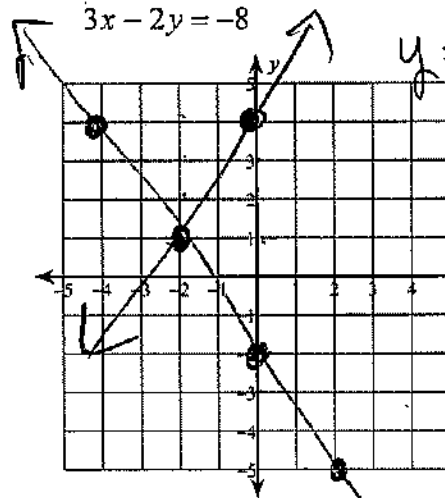
$$37) \ y = -\frac{1}{3}x - 1$$

$x = 3$



38) $3x + 2y = -4$

$$3x - 2y = -8$$



$$y = -\frac{3}{2}x - 2$$

$$(-2, 1)$$

$$\begin{array}{r} 3x - 2y = -8 \\ -3x \end{array}$$

$$\frac{-24}{-2} = \frac{-3x-8}{-2}$$

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

Solve each system by elimination.

$$\begin{array}{r} 39) \quad 4x + y = 11 \\ \quad -2x + y = -7 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{4}{2}$$

$$\boxed{x = 2}$$

$$\begin{array}{r} 4(2) + y = 11 \\ 8 + y = 11 \\ -8 \quad -8 \\ \hline \end{array}$$

$$y = 3$$

$$\boxed{(2, 3)}$$

$$\begin{array}{r} 40) \quad 3x - 5y = 3 \\ \quad (-1)(-7x - 5y = -7) \\ \hline \end{array}$$

$$3(1) - 5y = 3$$

$$3 - 5y = 3$$

$$\frac{-5y}{-5} = \frac{0}{-5} \quad y = 0$$

$$\begin{array}{r} 3x - 5y = 3 \\ 7x - 5y = 7 \\ \hline \end{array}$$

$$10x = 10$$

$$x = 1$$

$$\boxed{(1, 0)}$$

$$\begin{array}{r} 41) \quad 5x - y = 8 \quad | \times 10 \\ \quad 2x + 10y = -28 \\ \quad 50x - 10y = 80 \\ \hline \end{array}$$

$$\frac{52x}{52} = \frac{52}{52} \quad x = 1$$

$$\boxed{(1, -3)}$$

$$5(1) - y = 8$$

$$5 - y = 8$$

$$-y = 3$$

$$\frac{-y}{-1} = \frac{3}{-1} \quad y = -3$$

Solve each system by substitution.

$$\begin{array}{r} 42) \quad 4x + y = 15 \\ \quad 5x - y = 3 \end{array}$$

$$4x + y = 15$$

$$\begin{array}{r} -4x \quad -4x \\ \hline \end{array}$$

$$y = \boxed{-4x + 15}$$

$$5x - (-4x + 15) = 3$$

$$5x + 4x - 15 = 3$$

$$\frac{9x}{9} = \frac{18}{9}$$

$$x = 2$$

$$\boxed{(2, 7)}$$

$$4(2) + y = 15$$

$$8 + y = 15$$

$$\frac{-8}{-8} \quad \frac{7}{-8}$$

$$y = 7$$