

Solve. (Kahn Academy: Multi Step Equations)

1. $\frac{3}{2}x = -10 \cdot \frac{2}{3}$

$x = \frac{-20}{3}$

2. $\frac{x-5}{4} = \frac{3}{2}$ $12 = 2x - 10$

$22 = 2x$

$11 = x$

3. $2(x-7) = 2x + 14$ **No Solution**
 $2x - 14 = 2x + 14$
 $-14 \neq 14$

4. $3x - 4 = -x - 11$ $x = \frac{-7}{4}$
 $4x = -7$

Find the slope of the line passing through the following points: (Kahn Academy: Slope)

5. (5, 4) and (-3, 4)
 $\frac{4-4}{5+3} = \frac{0}{8} = 0$

6. (-1, 5) and (4, -9)
 $\frac{5+9}{-1-4} = \frac{-14}{5}$

7. (5, -5) and (5, -3)
 $\frac{-5+3}{5-5} = \frac{-2}{0} = \text{undefined}$

8. The line $2x + 3y = 6$
 $3y = -2x + 6$
 $y = -\frac{2}{3}x + 2$

9. The line parallel to $y = x$ 1

10. The line perpendicular to $y = 6x - 4$ $-\frac{1}{6}$

11. A line has a slope of 4. What is the slope of a line parallel? What is the slope of a line perpendicular?

$\text{parallel} = 4, \text{perpendicular} = -\frac{1}{4}$

12. Give the slope of a line parallel to $2x - y = 5$. $y = 2x - 5$ 2

13. Give the slope of any line perpendicular to $y = -3x + 1$ $\frac{1}{3}$

Give the equation of the line in slope intercept form: (Kahn Academy: Slope Intercept Form)

14. Passes through (6, -1), and has a slope of $\frac{2}{3}$
 $y + 1 = \frac{2}{3}(x - 6)$
 $y + 1 = \frac{2}{3}x - 4$

$y = \frac{2}{3}x - 5$

15. Passes through (-4, 6) and (2, 8).

$\frac{6-8}{-4-2} = \frac{-2}{-6} = \frac{1}{3}$ $y - 6 = \frac{1}{3}(x + 4)$
 $y - 6 = \frac{1}{3}x + \frac{4}{3}$ $y = \frac{1}{3}x + \frac{22}{3}$

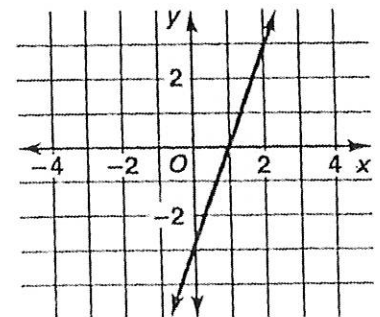
Use the graph to answer the following:

16. Find the slope 3

17. Find the x-intercept (1, 0)

18. Find the y-intercept (0, -3)

19. Equation: slope intercept form: $y = 3x - 3$



Solve each system. (Kahn Academy: Solving Systems of Equations)

$$20. \begin{cases} y = -2x \\ x + y = 12 \end{cases} \quad \underline{(-12, 24)}$$

$$\begin{aligned} x - 2x &= 12 & y &= -2(-12) \\ -x &= 12 & &= 24 \\ x &= -12 & & \end{aligned}$$

$$22. \begin{cases} 3s - 5t = -16 \\ 2s + 5t = 31 \end{cases} \quad \underline{(3, 5)}$$

$$\begin{aligned} 5s &= 15 & 3(3) - 5t &= -16 \\ s &= 3 & -5t &= -25 \\ & & t &= 5 \end{aligned}$$

$$24. \begin{cases} a + b = 10 \\ a - b = -10 \end{cases} \quad \underline{(0, 10)}$$

$$\begin{aligned} 2a &= 0 & b &= 10 \\ a &= 0 & & \end{aligned}$$

$$21. \begin{cases} y - 2x = 6 \\ 4x - 2y = -12 \end{cases} \quad \underline{\text{all real numbers}}$$

$$\begin{aligned} 2(-2x + y) &= 6 \\ 4x - 2y &= -12 \\ -4x + 2y &= 12 \end{aligned}$$

$$23. \begin{cases} 3x - 2y = 8 \\ 2x + 3y = 14 \end{cases} \quad \underline{(4, 2)}$$

$$\begin{aligned} 9x - 6y &= 24 & 3(4) - 2y &= 8 \\ 4x + 6y &= 28 & -2y &= -4 \\ 13x &= 52 & y &= 2 \end{aligned} \quad x=4$$

$$25. \begin{cases} y = -6 \\ 5x - y = 26 \end{cases} \quad \underline{(4, -6)}$$

$$\begin{aligned} 5x + 6 &= 26 \\ 5x &= 20 \\ x &= 4 \end{aligned}$$

Factor. (Kahn Academy: Factoring- Quadratics and GCF)

26. $3x^2 + 15x - 18$

$$3(x^2 + 5x - 6)$$

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

27. $x^2 + 3x - 6$

$$\text{Prime}$$

28. $3a^2 - 2a - 21$

$$(3a + 7)(a - 3)$$

29. $y^2 + 6y - 40$

$$(y + 10)(y - 4)$$

30. $7x^2y + 14xy^2$

$$7xy(x + 2y)$$

31. $5x^2 - 17x + 14$

$$(5x - 7)(x - 2)$$

32. $5a^2 - 20a + 15$

$$5(a^2 - 4a + 3)$$

$$5(a - 3)(a - 1)$$

33. $2n^2 - 11n - 13$

$$(2n - 13)(n + 1)$$

34. $25x^2 - 70x + 49$

$$(5x - 7)(5x - 7)$$

36. $4k^2 + 2k - 12$

$$2(2k^2 + k - 6)$$

$$2(2k - 3)(k + 2)$$

37. $8x^2 - 72$

$$8(x^2 - 9)$$

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

38. $x^2 + 22x + 121$

$$(x + 11)(x + 11)$$

39. $36x^2 - 12x + 1$

$$(6x - 1)(6x - 1)$$

40. $-y^2 + 100$ $100 - y^2$

$$(10 + y)(10 - y)$$

Solve. (Kahn Academy: Solving Quadratics Using Factoring)

41. $16x^2 - 64 = 0$

$16(x^2 - 4) = 0$

$x^2 - 4 = 0$
 $(x+2)(x-2) = 0$

$x = \pm 2$

44. $x^2 + 11x + 24 = 0$

$(x+3)(x+8) = 0$

$x+3=0, x+8=0$

$x = -3, -8$

47. $16x^2 + 4x = 0$

$4x(4x+1) = 0$

$4x=0, 4x+1=0$

$x=0, x=-\frac{1}{4}$

42. $16x^2 + 8x + 1 = 0$

$(4x+1)(4x+1) = 0$

$4x+1=0$

$4x = -1$

$x = -\frac{1}{4}$

45. $x^2 + 2x = 24$

$x^2 + 2x - 24 = 0$

$(x+6)(x-4) = 0$

$x = -6, 4$

43. $25x^2 + 20x + 4 = 0$

$(5x+2)(5x+2) = 0$

$5x+2=0$

$5x = -2$

$x = -\frac{2}{5}$

46. $x^2 + 14x = -33$

$x^2 + 14x + 33 = 0$

$(x+11)(x+3) = 0$

$x = -11, -3$

48. $0 = x^2 - 9$

$0 = (x+3)(x-3)$

$x = \pm 3$

49. $(3x-1)(x+6) = 0$

$3x-1=0, x+6=0$

$x = \frac{1}{3}, x = -6$

Simplify. (Kahn Academy: Radical Expressions- Simplifying, Rationalizing, Adding/Subtracting, Multiplying)

50. $\sqrt{52} = 2\sqrt{13}$

51. $(2\sqrt{2})(3\sqrt{24})$

$= 2\sqrt{2} (6\sqrt{6})$

$= 12\sqrt{12}$

$= 24\sqrt{3}$

52. $\sqrt{\frac{10}{3}} = \frac{\sqrt{10}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{30}}{3}$

53. $\frac{\sqrt{6}}{\sqrt{12}} = \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

54. $(3 + \sqrt{2})(3 - \sqrt{2})$

$= 9 - 3\sqrt{2} + 3\sqrt{2} - 2$

$= 7$

55. $12\sqrt{5} - 3\sqrt{7} - 6\sqrt{7} - 8\sqrt{5}$

$= 4\sqrt{5} - 9\sqrt{7}$

56. $2\sqrt{20} + 3\sqrt{45} + \sqrt{180}$

$= 4\sqrt{5} + 9\sqrt{5} + 6\sqrt{5}$

$= 19\sqrt{5}$

57. $(3 - \sqrt{5})^2$

$= (3 - \sqrt{5})(3 - \sqrt{5})$

$= 9 - 3\sqrt{5} - 3\sqrt{5} + 5$

$= 14 - 6\sqrt{5}$

58. $\sqrt{6}(\sqrt{3} + 5\sqrt{2})$

$= \sqrt{18} + 5\sqrt{12}$

$= 3\sqrt{2} + 10\sqrt{3}$

59. $(4\sqrt{5} - 2\sqrt{3})(3\sqrt{6} - \sqrt{10})$

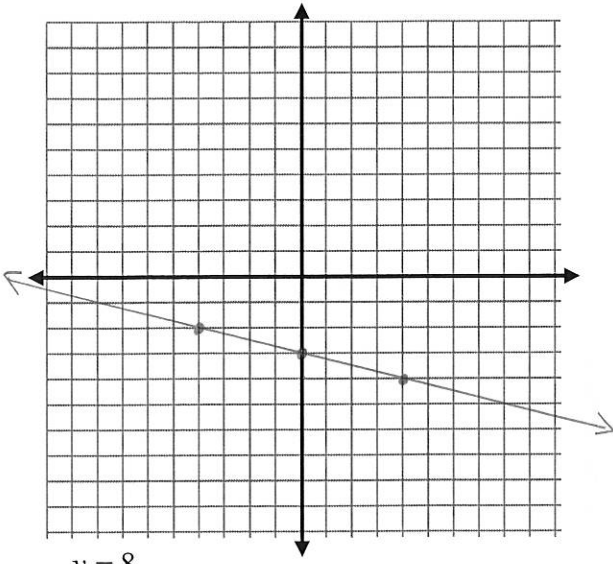
$= 12\sqrt{30} - 4\sqrt{50} - 6\sqrt{18} + 2\sqrt{30}$

$= 14\sqrt{30} - 20\sqrt{2} - 18\sqrt{2}$

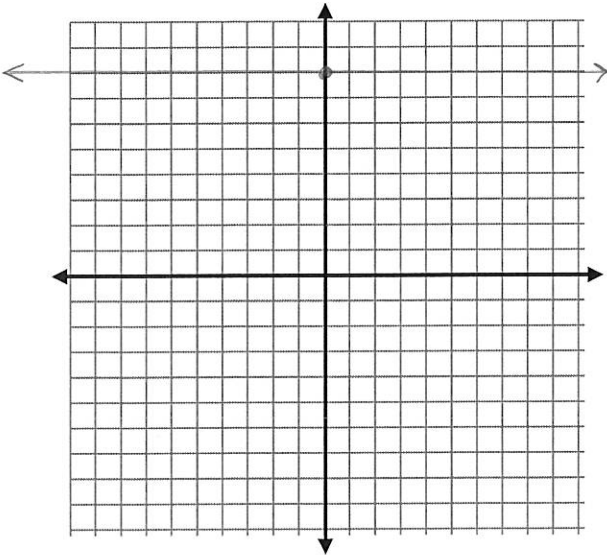
$= 14\sqrt{30} - 38\sqrt{2}$

Graph the following equations. (Kahn Academy: Graphing Linear Equations)

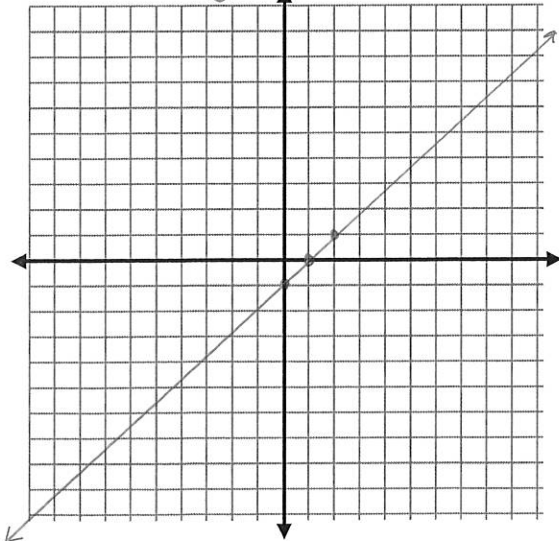
60. $y = -\frac{1}{4}x - 3$



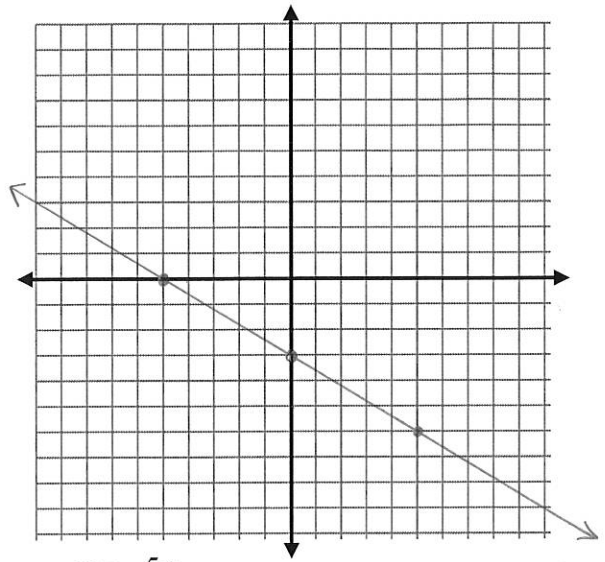
62. $y = 8$



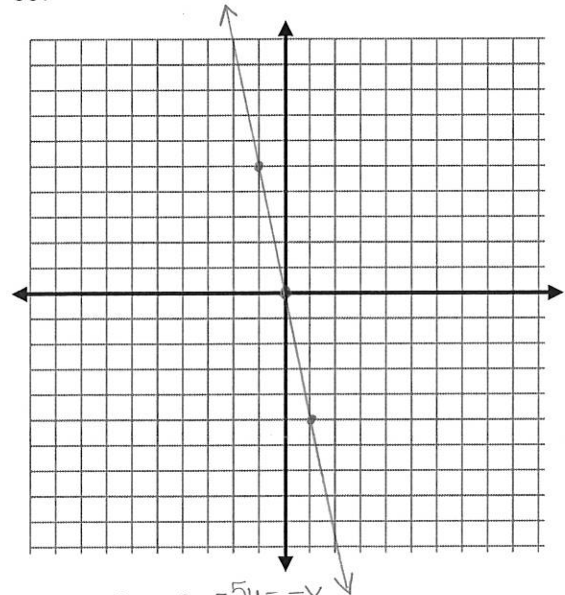
64. $x - y = 1$
 $-y = -x + 1$
 $y = x - 1$



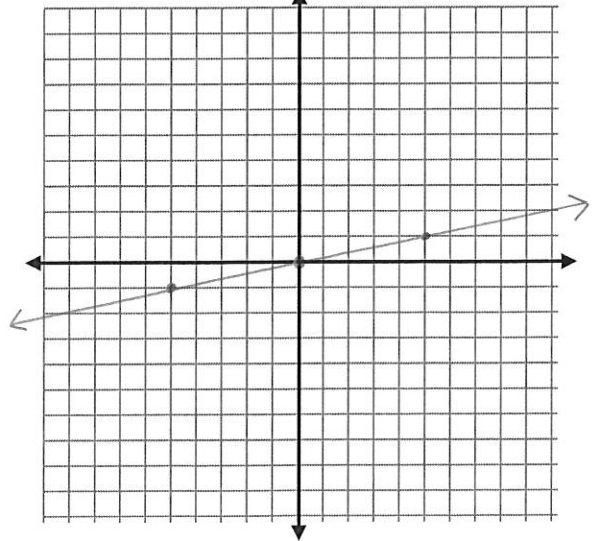
61. $3x + 5y = -15$
 $5y = -3x - 15$
 $y = -\frac{3}{5}x - 3$



63. $y = -5x$



65. $x - 5y = 0$
 $-5y = -x$
 $y = \frac{1}{5}x$



Solve. (Kahn Academy: Solving Linear Inequalities)

66. $5b - 1 \geq -11$

$$5b \geq -10$$

$$b \geq -2$$

68. $-\frac{2}{3}x - 4 \geq 4$

$$-\frac{3}{3} \cdot -\frac{2}{3}x \geq 8 \cdot -\frac{3}{2}$$

$$x \leq -12$$

70. $3x - 2(8x - 9) > -2x - 4$

$$3x - 16x + 18 > -2x - 4$$

$$22 > 11x$$

$$2 > x \quad x < 2$$

72. $4x - 6 \geq 6x - 20$

$$14 \geq 2x$$

$$7 \geq x$$

$$x \leq 7$$

74. $10 > -6 + 2x$

$$16 > 2x$$

$$8 > x$$

$$x < 8$$

67. $21 > 15 + \frac{a}{2}$

$$6 > \frac{a}{2}$$

$$12 > a$$

$$a < 12$$

69. $7x + 37 < 13x - 11$

$$48 < 6x$$

$$8 < x$$

$$x > 8$$

71. $3x - 6x + 8 < -10$

$$-3x < -18$$

$$x > 6$$

73. $6 > \frac{3}{4}x + 12$

$$\frac{4}{3} \cdot -6 > \frac{3}{4}x \cdot \frac{4}{3}$$

$$-8 > x$$

$$x < -8$$

75. $10 \geq 2m - 2(m - 5)$

$$10 \geq 2m - 2m + 10$$

$$10 \geq 10$$

$$\text{All real numbers}$$

