Chapter 1

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

$a=1 \quad b=-9 \quad c=0$

$x = \frac{-(-9) \pm \sqrt{(-9)^2 - 4 \cdot 1 \cdot 0}}{2 \cdot 1}$

$x = \frac{9 \pm \sqrt{(-9)^2 - 4 \cdot 1 \cdot 0}}{2 \cdot 1}$

$x = \frac{9 \pm 9}{2}$

$x = (0, 9)$

11. $x^2 - 25 = 0$

$a=1 \quad b=0 \quad c=-25$

$x = \frac{-0 \pm \sqrt{0^2 - 4 \cdot 1 (-25)}}{2 \cdot 1}$

$x = \frac{0 \pm \sqrt{0^2 - 4 \cdot 1 (-25)}}{2 \cdot 1}$

$x = \frac{\pm 10}{2}$

$x = (5, -5)$

13. $z^2 + z - 6 = 0$

$a=1 \quad b=1 \quad c=-6$

$z = \frac{-1 \pm \sqrt{1^2 - 4 \cdot 1 (-6)}}{2 \cdot 1}$

$z = \frac{-1 \pm 5}{2}$

$z = (2, -3)$

15. $2x^2 - 5x - 3 = 0$

$a=2 \quad b=-5 \quad c=-3$

$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4 \cdot 2 (-3)}}{2 \cdot 2}$

$x = \frac{5 \pm 7}{4}$

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

17. $2t^2 - 48 = 0$

$a=1 \quad b=0 \quad c=-16$

$t = \frac{-0 \pm \sqrt{0^2 - 4 \cdot 1 (-16)}}{2 \cdot 1}$

$t = \frac{\pm 8}{2}$

$t = (4, 4)$

19. $x(x-8) + 12 = 0$

$a=1 \quad b=-8 \quad c=12$

$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4 \cdot 1 \cdot 12}}{2 \cdot 1}$

$x = \pm \frac{8}{4}$

$x = (6, 2)$

21. $4x^2+9=12x$

$a=4\ b=-12\ c=9$

$x=\frac{-(12)\pm\sqrt{(-12)^2-4\cdot4\cdot9}}{2\cdot4}$

$\frac{-(-12)}{2\cdot4}=\frac{3}{2}$

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

23. $6(p^2-1)=5p$

$a=6\ b=-5\ c=-6$

$p=\frac{-(-5)\pm\sqrt{(-5)^2-4\cdot6(-6)}}{2\cdot6}$

$p=\frac{5\pm13}{12}$

$p=\frac{3}{2},\ p=-\frac{2}{3}$

25. $6x-5=\frac{6}{x}$

$a=6\ b=-5\ c=-6$

$x=\frac{-(-5)\pm\sqrt{(-5)^2-4\cdot6(-6)}}{2\cdot6}$

$x=\frac{5\pm13}{12}$

$x=\left(\frac{3}{2},-\frac{3}{2}\right)$

27. $\frac{4(x-2)}{x-3}+\frac{3}{x}=\frac{-3}{x(x-3)}$

$\frac{4(x-2)x+3(x-3)}{(x-3)x}=\frac{3}{x(x-3)}$

$(x-2)\left(\frac{4x(x-2)}{x-2}+3\left(\frac{x-3}{x-2}\right)\right)=0$

$(x-2)(4x+3)=0$

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

29. $x^2=25$

$x=5\ x=-5$

$x=(5,-5)$

31. $(x-1)^2=4$

$x^2-2x-3=0$

$\frac{-(-2)\pm\sqrt{(-2)^2-4\cdot1(-3)}}{2\cdot1}$

$x=\frac{2\pm4}{2}$

$x=(3,-1)$

33. $(2y+3)^2=9$

$y=\frac{-3\pm\sqrt{3^2-4\cdot1\cdot0}}{2\cdot1}$

$y=\frac{-3\pm3}{2}\quad y=(0,3)$

35. $x^2+4x=21$

$x=\frac{-4\pm\sqrt{4^2-4\cdot1(-21)}}{2\cdot1}$

$x=\frac{-4\pm10}{2}$

$x=(3,-7)$

37. $x^2-\frac{1}{2}x-\frac{3}{16}=0$

$x=\frac{8\pm\sqrt{(-8)^2-4\cdot16(-3)}}{2\cdot16}$

$x=\frac{8\pm16}{32}$

$x=(3/4,-1/4)$

39. $3x^2+x-\frac{1}{2}=0$

$x=\frac{-2\pm\sqrt{2^2-4\cdot6(-1)}}{2\cdot6}$

$x=\frac{-1\pm\sqrt{7}}{6}$

41. $x^2-4x+2=0$

$x=\frac{-(-4)\pm\sqrt{(-4)^2-4\cdot1(-21)}}{2\cdot1}$

$x=\frac{4\pm10}{2}=x=(7,-3)$

43. $x^2-4x-1=0$

$x=\frac{-(-4)\pm\sqrt{(-4)^2-4\cdot1(-1)}}{2}$

$x=4\pm2\sqrt{\frac{5}{2}}$

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

45. $2x^2-5x-3=0$

$\frac{-(-5)\pm\sqrt{(-5)^2-4\cdot2(-3)}}{2\cdot2}$

$x=\frac{5\pm7}{4}$

$x=(3,-1/2)$

47. $4y^2-y+2=0$

$y=\frac{-(-1)\pm\sqrt{(-1)^2-4\cdot2\cdot2}}{2\cdot2}$

$y=\frac{1}{4}\pm\sqrt{15\cdot\left(\frac{1}{4}\right)i}$

49. $4x^2=1-2x$

$x=\frac{-2\pm\sqrt{2^2-4\cdot2(-1)}}{2\cdot2}$

$x=-1\pm\sqrt{3/2}$

51. $4x^2 = 9x$

$x = \frac{-(-9) \pm \sqrt{(-9)^2 - 4 \cdot 4 \cdot 0}}{2 \cdot 4}$

$x = \frac{9 \pm 9}{8}$

$x = (0, 9/4)$

53. $9t^2 - 6t + = 0$

$t = \frac{-(6) \pm \sqrt{(-6)^2 - 4 \cdot 9 \cdot}}{2 \cdot 9}$

$t = \frac{6 \pm \sqrt{(-6)^2 - 4 \cdot 9 \cdot 1}}{2 \cdot 9}$

$t = 1/3$

55 $3/4x^2 - 1/4x - 1/2 = 0$

$x = \frac{-(-1) \pm \sqrt{(-1)^2 - 4 \cdot 3(-2)}}{6}$

$x = \frac{1 \pm 5}{6}$ $x = (1, -2/3)$

57. $5/3x^2 - x = 1/3$

$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4 \cdot 5(-}}{}$

$x = 3 \pm \sqrt{29/10}$

59 $2x(x+2) = 3$

$x = \frac{-4 \pm \sqrt{4^2 - 4 \cdot 2(-3)}}{2 \cdot 2}$

$x = -2 \pm \sqrt{10/2}$

61. $4 - 1/x - 2/x^2 = 0$

$x = \frac{-(-1) \pm \sqrt{(-1)^2 - 4 \cdot 4(-2}}{}$

$x = 1 \pm \sqrt{33/8}$

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

$x = \frac{-(-9) \pm \sqrt{(-9)^2 - 4 \cdot 1 \cdot 2}}{}$

$x = 9 \pm \sqrt{73/2}$

65. $x^2 - 4.1x + 2.2 = 0$

$x_1 = \frac{-(-4.1) \pm \sqrt{(-4.1)^2 - 4 \cdot 2}}{2}$

$x = \frac{4.1 \pm \sqrt{16.81 - 8.8}}{2}$

$x = (3.46509, 0.63490$

67 $x^2 + \sqrt{3x} - 3 = 0$

$\sqrt{3x} = -x^2 + 3$

$3x = (-x^2 + 3)^2$

71. $2x^2-6x+7=0$

$x=\frac{-(-6)\pm\sqrt{(-6)^2-4\cdot2(7)}}{2\cdot2}$

$x=\frac{6\pm2\sqrt{23}}{4}$

$x=\frac{3\pm\sqrt{23}}{2}$

73. $9x^2-30x+25=0$

$x=\frac{-(-30)\pm\sqrt{(-30)^2-4\cdot9\cdot25}}{}$

$x=5/3$

75. $3x^2+5x-8=0$

$x=\frac{-5\pm\sqrt{5^2-4\cdot3(-8)}}{2\cdot3}$

$x=\frac{-5+11}{6}$ $x=\frac{-5-11}{6}$

$x=(1,-8/3)$

77. $x^2-5=0$

$x=\frac{-0\pm\sqrt{0^2-4\cdot1(-5)}}{2\cdot1}$

$x=\pm2\sqrt{5}/2$

$x=\pm\sqrt{5}$

79. $16x^2-8x+1=0$

$x=\frac{-(-8)\pm\sqrt{(-8)^2-4\cdot16\cdot1}}{2\cdot16}$

$x=\frac{8\pm\sqrt{(-8)^2-4\cdot16\cdot1}}{2\cdot16}$

$x=1/4$

81. $10x^2-19x-15=0$

$x=\frac{-(-19)\pm\sqrt{(-19)^2-4\cdot10(-15)}}{}$

$x=\frac{19\pm31}{20}$

$x=(5/2,-3/5)$

83. $2+z=6z^2$

$z=\frac{-(-1\pm\sqrt{(-1)^2-4\cdot6(-2)}}{}$

$z=1\pm7/12$

$z=(2/3,-1/2$

85. $x^2+x=4$

$x=\frac{-1\pm\sqrt{1^2-4\cdot1(-4)}}{2\cdot1}$

$x=\frac{-1\pm\sqrt{17}/2}{}$

$x=\frac{\sqrt{17}-1}{2},\ \frac{\sqrt{17}+1}{2}$

89. $\frac{x}{x-2}+\frac{2}{x+1}=\frac{7x+1}{x^2-x-2}$

$x^2-4x-5=0$

$x=\frac{-(-4)\pm\sqrt{(-4)^2-4\cdot1(-5)}}{2\cdot1}$

$x=5$