L3.3b – Completing the Square with $ax^2 + bx + c,\ a \neq 1$ **Pg 116 #31-63 odd, 64**

31. $t = -2 \pm 2i$

33. $x = -3 \pm i$

35. $x = 5 \pm 2\sqrt{7}$

37. The constant $4(9) = 36$ should have been added to the right side of the equation instead of 9.

$$4x^2 + 24x - 11 = 0$$
$$4(x^2 + 6x) = 11$$
$$4(x^2 + 6x + 9) = 11 + 4(9)$$
$$4(x + 3)^2 = 47$$
$$(x + 3)^2 = \frac{47}{4}$$
$$x + 3 = \pm\frac{\sqrt{47}}{2}$$
$$x = -3 \pm\frac{\sqrt{47}}{2}$$

39. yes; All of the steps would be the same as with two real solutions, with the exception of the constant being negative when you take the square root.

41. factoring; The equation can be factored; $x = 7$ and $x = -3$

43. square roots; The equation can be written in the form $u^2 = d$; $x = -8$ and $x = 0$

45. factoring; The equation can be factored; $x = -6$

47. completing the square; The equation cannot be factored or written in the form $u^2 = d$; $x = -1 \pm \frac{\sqrt{10}}{2}$

49. square roots; The equation can be written in the form $u^2 = d$; $x = \pm 10$

51. $x = -5 + 5\sqrt{3}$

53. $x = -2 + 2\sqrt{21}$

55. $f(x) = (x - 4)^2 + 3$; $(4, 3)$

57. $g(x) = (x + 6)^2 + 1$; $(-6, 1)$

59. $h(x) = (x + 1)^2 - 49$; $(-1, -49)$

61. $f(x) = \left(x - \frac{3}{2}\right)^2 + \frac{7}{4}$; $\left(\frac{3}{2}, \frac{7}{4}\right)$

63. **a.** 22 ft
b. about 2.1 sec

64. 510 ft; 3 sec