A23 1) pgs 108-110/ 31, 32, 41, 43, 51, 53, 55, 59, 66, 67, 68, 69, 71, 73, 77

2) pgs. 116-118/ 25, 33, 46, 48, 55, 56, 60, 61, 63, 66, 67, 68

Key

31. a. $\sqrt{-9} + \sqrt{-4} - \sqrt{16}$

$3i + 2i - 4$

(31a) $-4 + 5i$

b. $\sqrt{-16} + \sqrt{8} + \sqrt{-36}$

$4i + 2\sqrt{2} + 6i$

(31b) $2\sqrt{2} + 10i$

32. $z + z_a = 0$

a. $i + i \quad -1 - i$

b. $3 - i \quad -3 + i$

c. $-2 + 8i \quad +2 - 8i$

41. $(4-2i)(4+2i)$

$16 + 8i - 8i - 4i^2$

$16 + 4$

(41) 20

43. $(3-6i)^2$

$(3-6i)(3-6i)$

$9 - 18i - 18i + 36i^2$

$9 - 76i - 36$

(43) $-27 - 36i$

51. $x^2 - 4 = -11$

$+4 \quad = +4$

$x^2 = -9$

$\sqrt{\quad} \quad = \sqrt{\quad}$

invisible step → $x = \pm i\sqrt{7}$

53. $2x^2 + 6 = -34$

$2x^2 = -40$

$x^2 = -20$

$\sqrt{\quad} \quad = \sqrt{\quad}$

I.S. →

(53) $x = \pm 2i\sqrt{5}$

55. $0 = 3x^2 + 6$

$-6 = 3x^2$

$-2 = x^2$

$\sqrt{\quad} \quad = \sqrt{\quad}$

(55) $\pm i\sqrt{2} = x$

59. $0 = -x^2 - 27$

$-27 = x^2$

$\sqrt{\quad} \quad = \sqrt{\quad}$

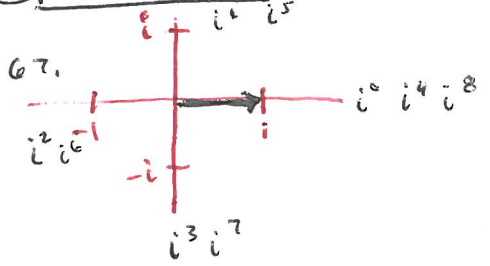
(59) $\pm 3i\sqrt{3} = x$

66a. $\sqrt{a} \cdot \sqrt{b} = \sqrt{a \cdot b}$

$\sqrt{-4} \cdot \sqrt{-9} = \sqrt{36} = 6$

(66) No $2i \cdot 3i = 6i^2 = -6$

67.



68. f is from real zeros

h has imaginary zeros

b/c doesn't touch x axis

69. $(3+4i) - (7-5i) + 2i(9+12i)$

$3 + 4i - 7 + 5i + 18i - 24$

(69) $-28 + 27i$

71. $(3+5i)(2-7i^4)$ } Gen DASD

$(3+5i)(-5)$

(71) $-15 - 25i$

73. $(2 + 4i^5) + (1 - 9i^6) + (3 + i^7)$

$2 + 4i + 1 + 9 - 3 - (-i)$

(73) $9 + 5i$

77. a. F $(3-5i) + (4+5i) = 7$

b. T $(3i)(2i) = 6i^2 = -6$

c. T $3i = 0 + 3i$

d. F $1 + 8i$

(A23) cont. 2) p.116 #E/ 25, 33, 46, 48, 55, 56, 60, 61, 63, 66, 67, 68

25. $x^2+6x+3=0$

$-3 \quad -3$

$x^2+6x+9 = -3+9$

$3 \times 3 = 9$, $3+3=6$

$(x+3)(x+3) = 6$

$(x+3)^2 = 6$

$\sqrt{\quad} \quad = \sqrt{\quad}$

IS → $x+3 = \pm\sqrt{6}$

(25) $\boxed{x = -3 \pm \sqrt{6}}$

33. $\frac{5x^2+30x+50}{5} = \frac{0}{5}$

$x^2+6x+10=0$

$x^2+6x+\underline{9} = -10+\underline{9}$

$3 \times 3 = 9$, $3+3=6$

$(x+3)^2 = -1$

$\sqrt{\quad} \quad = \sqrt{\quad}$

$x+3 = \pm i$

(33) $\boxed{x = -3 \pm i}$

46. $x^2-16x+64=0$

F $-8 \times -8 = 64$, $-8-8=-16$

$(x-8)(x-8)=0$

(46) $\boxed{x=8}$

48. $3x^2+12x+1=0$

$x = \frac{-12 \pm \sqrt{144-4(3)(1)}}{2 \cdot 3}$

$= \frac{-12 \pm \sqrt{132}}{6}$ 4.33

(48) $\boxed{x = -2 \pm \frac{\sqrt{33}}{3}}$

55. $f(x) = x^2-8x+19$

$f(x) = x^2+8x+\underline{16}+19-\underline{16}$

$-4 \times -4 = 16$, $-4-4=-8$

(55) $\boxed{f(x) = (x-4)^2+3}$

56. $g(x) = x^2-4x-1$

$g(x) = x^2-4x+\underline{4}-1-\underline{4}$

$-2 \times -2 = 4$, $-2-2=-4$

(56) $\boxed{g(x) = (x-2)^2-5}$

60. $f(x) = x^2+6x-16$

$f(x) = x^2+6x+\_\_-16-\_\_$