

9.4

1) $4a^2 + 6 = 0$

$a = 4, b = 0, c = 6$

$$\frac{-0 \pm \sqrt{0^2 - 4(4)(6)}}{2(4)} = \frac{\pm \sqrt{-96}}{8} = \frac{\pm \sqrt{-16 \cdot 6}}{8} = \frac{\pm 4i\sqrt{6}}{8} = \frac{\pm i\sqrt{6}}{2}$$

3) $2x^2 - 8x - 2 = 0$

$a = 2, b = -8, c = -2$

$$\frac{8 \pm \sqrt{(-8)^2 - 4(2)(-2)}}{2(2)} = \frac{8 \pm \sqrt{64 + 16}}{4} = \frac{8 \pm \sqrt{80}}{4} = \frac{8 \pm \sqrt{16 \cdot 5}}{4} = \frac{8 \pm 4\sqrt{5}}{4} = 2 \pm \sqrt{5}$$

5) $2m^2 - 3 = 0$

$a = 2, b = 0, c = -3$

$$\frac{-0 \pm \sqrt{(0)^2 - 4(2)(-3)}}{2(2)} = \frac{\pm \sqrt{24}}{4} = \frac{\pm \sqrt{4 \cdot 6}}{4} = \frac{(\pm 2\sqrt{6})}{4} = \frac{\pm \sqrt{6}}{2}$$

7) $3r^2 - 2r - 1 = 0$

$a = 3, b = -2, c = -1$

$$\frac{2 \pm \sqrt{(-2)^2 - 4(3)(-1)}}{2(3)} = \frac{2 \pm \sqrt{4 + 12}}{6} = \frac{2 \pm \sqrt{16}}{6} = \frac{2 \pm 4}{6} = 1, -\frac{1}{3}$$

9) $4n^2 - 36 = 0$

$a = 4, b = 0, c = -36$

$$\frac{-0 \pm \sqrt{0^2 - 4(4)(-36)}}{2(4)} = \frac{\pm \sqrt{576}}{8} = \frac{\pm 24}{8} = \pm 3$$

11) $v^2 - 4v - 5 = -8$

$$\frac{+8}{+8} + 8$$

$v^2 - 4v + 3 = 0$

$a = 1, b = -4, c = 3$

$$\frac{4 \pm \sqrt{(-4)^2 - 4(1)(3)}}{2(1)} = \frac{4 \pm \sqrt{16 - 12}}{2} = \frac{4 \pm \sqrt{4}}{2} = \frac{4 \pm 2}{2} = 3, 1$$

13) $2a^2 + 3a + 14 = 6$

$$\frac{-14}{-14} - 14$$

$2a^2 + 3a + 8 = 0$

$a = 2, b = 3, c = 8$

$$\frac{-3 \pm \sqrt{(3)^2 - 4(2)(8)}}{2(2)} = \frac{-3 \pm \sqrt{9 - 64}}{4} = \frac{-3 \pm \sqrt{-55}}{4} = \frac{-3 \pm i\sqrt{55}}{4}$$

15) $3k^2 + 3k - 4 = 7$

$$\frac{-7}{-7} - 7$$

$3k^2 + 3k - 11 = 0$

$a = 3, b = 3, c = -11$

$$\frac{-3 \pm \sqrt{3^2 - 4(3)(-11)}}{2(3)} = \frac{-3 \pm \sqrt{9 + 132}}{6} = \frac{-3 \pm \sqrt{141}}{6}$$

$$17) 7x^2 + 3x - 16 = -2$$

$$\frac{\quad + 2 \quad + 2}{\quad}$$

$$7x^2 + 3x - 14 = 0$$

$$a = 7, b = 3, c = -14$$

$$\frac{-3 \pm \sqrt{3^2 - 4(7)(-14)}}{2(7)} = \frac{-3 \pm \sqrt{9 + 392}}{14} = \frac{-3 \pm \sqrt{401}}{14}$$

$$19) 2p^2 + 6p - 16 = 4$$

$$\frac{\quad - 4 \quad - 4}{\quad}$$

$$2p^2 + 6p - 20 = 0$$

$$a = 2, b = 6, c = -20$$

$$\frac{-6 \pm \sqrt{6^2 - 4(2)(-20)}}{2(2)} = \frac{-6 \pm \sqrt{36 + 160}}{4} = \frac{-6 \pm \sqrt{196}}{4} = \frac{-6 \pm 14}{4} = 2, -5$$

$$21) 3n^2 + 3n = -3$$

$$\frac{\quad + 3 \quad + 3}{\quad}$$

$$3n^2 + 3n + 3 = 0$$

$$a = 3, b = 3, c = 3$$

$$\frac{-3 \pm \sqrt{(3)^2 - 4(3)(3)}}{2(3)} = \frac{-3 \pm \sqrt{9 - 36}}{6} = \frac{-3 \pm \sqrt{-9 \cdot 3}}{6} = \frac{-3 \pm 3i\sqrt{3}}{6} = \frac{-1 \pm i\sqrt{3}}{2}$$

$$23) 2x^2 = -7x + 49$$

$$\frac{\quad + 7x - 49 \quad + 7x - 49}{\quad}$$

$$2x^2 + 7x - 49 = 0$$

$$a = 2, b = 7, c = -49$$

$$\frac{-7 \pm \sqrt{(7)^2 - 4(2)(-49)}}{2(2)} = \frac{-7 \pm \sqrt{49 + 392}}{4} = \frac{-7 \pm \sqrt{441}}{4}$$

$$25) 5x^2 = 7x + 7$$

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

$$5x^2 - 7x - 7 = 0$$

$$a = 5, b = -7, c = -7$$

$$\frac{7 \pm \sqrt{(-7)^2 - 4(5)(-7)}}{2(5)} = \frac{7 \pm \sqrt{49 + 140}}{10} = \frac{7 \pm \sqrt{189}}{10} = \frac{7 \pm \sqrt{9 \cdot 21}}{10} = \frac{7 \pm 3\sqrt{21}}{10}$$

$$27) 8n^2 = -3n - 8$$

$$\frac{\quad + 3n + 8 \quad + 3n + 8}{\quad}$$

$$8n^2 + 3n + 8 = 0$$

$$a = 8, b = 3, c = 8$$

$$\frac{-3 \pm \sqrt{3^2 - 4(8)(8)}}{2(8)} = \frac{-3 \pm \sqrt{9 - 256}}{16} = \frac{-3 \pm \sqrt{-247}}{16} = \frac{-3 \pm i\sqrt{247}}{16}$$

$$29) 2x^2 + 5x = -3$$

$$\frac{\quad +3 \quad +3}{2x^2 + 5x + 3 = 0}$$

$$a = 2, b = 5, c = 3$$

$$\frac{-5 \pm \sqrt{5^2 - 4(2)(3)}}{2(2)} = \frac{-5 \pm \sqrt{25 - 24}}{4} = \frac{-5 \pm \sqrt{1}}{4} = \frac{-5 \pm 1}{4} = -1, -\frac{3}{2}$$

$$31) 4a^2 - 64 = 0$$

$$a = 4, b = 0, c = -64$$

$$\frac{-0 \pm \sqrt{0^2 - 4(4)(-64)}}{2(4)} = \frac{\pm \sqrt{1024}}{8} = \frac{\pm 32}{8} = \pm 4$$

$$33) 4p^2 + 5p - 36 = 3p^2$$

$$\frac{-3p^2 \quad -3p^2}{p^2 + 5p - 36 = 0}$$

$$a = 1, b = 5, c = -36$$

$$\frac{-5 \pm \sqrt{5^2 - 4(1)(-36)}}{2(1)} = \frac{-5 \pm \sqrt{25 + 144}}{2} = \frac{-5 \pm \sqrt{169}}{2} = \frac{-5 \pm 13}{2} = 4, -9$$

$$35) -5n^2 - 3n - 52 = 2 - 7n^2$$

$$\frac{\quad +7n^2 \quad -2 \quad -2 + 7n^2}{2n^2 - 3n - 54 = 0}$$

$$a = 2, b = -3, c = -54$$

$$\frac{3 \pm \sqrt{(-3)^2 - 4(2)(-54)}}{2(2)} = \frac{3 \pm \sqrt{9 + 432}}{4} = \frac{3 \pm \sqrt{441}}{4} = \frac{3 \pm 21}{4} = 6, -\frac{9}{2}$$

$$37) 7r^2 - 12 = -3r$$

$$\frac{\quad +3r \quad +3r}{7r^2 + 3r - 12 = 0}$$

$$a = 7, b = 3, c = -12$$

$$\frac{-3 \pm \sqrt{3^2 - 4(7)(-12)}}{2(7)} = \frac{-3 \pm \sqrt{9 + 336}}{14} = \frac{-3 \pm \sqrt{345}}{14}$$

$$39) 2n^2 - 9 = 4$$

$$\frac{\quad -4 \quad -4}{2n^2 - 13 = 0}$$

$$a = 2, b = 0, c = -13$$

$$\frac{-0 \pm \sqrt{0^2 - 4(2)(-13)}}{2(2)} = \frac{\pm \sqrt{104}}{4} = \frac{\pm \sqrt{4 \cdot 26}}{4} = \frac{\pm 2\sqrt{26}}{4} = \frac{\pm \sqrt{26}}{2}$$