$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

pg. 289 # 3-51 x3, 63, 66

3. $2x^2+5x-7=0$

$$x = \frac{-5 \pm \sqrt{5^2-4(2)(-7)}}{2(2)} = -\frac{5 \pm \sqrt{25+56}}{4}$$

$$= -\frac{5 \pm \sqrt{81}}{4} = -\frac{5+9}{4} = \frac{4}{4} = 1$$

$$= -\frac{5-9}{4} = -\frac{14}{4} = -\frac{7}{2}$$

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

$$x = \frac{-3 \pm \sqrt{3^2-4(1)(5)}}{2(1)} = -\frac{3 \pm \sqrt{9-20}}{2} = -\frac{3 \pm \sqrt{-11}}{2}$$

$$= -\frac{3 \pm i\sqrt{11}}{2}$$

or $-\frac{3}{2} + \frac{i\sqrt{11}}{2}$

24. $3x^2+4x-3=0$

$$x = \frac{-4 \pm \sqrt{4^2-4(3)(-3)}}{2(3)} = -\frac{4 \pm \sqrt{16+36}}{6}$$

$$= -\frac{4 \pm \sqrt{52}}{6}$$

52 → 2 · 26 → 2 · 13

$$-\frac{4 \pm 2\sqrt{13}}{6} = -\frac{4}{6} \pm \frac{2\sqrt{13}}{6}$$

$$= -\frac{2}{3} \pm \frac{\sqrt{13}}{3}$$

$$= .54 \text{ \& } -1.87$$

33. b^2-4ac

$20^2-4(4)(25)$

$400-400=0$

1 real solution

42. $5x^2 = 210x$

$5x^2 - 210x = 0$

$(5x)(x - 42) = 0$

$5x = 0$ $\quad x - 42 = 0$

$x = 0$ $\quad x = 42$

45 QF

48. QF

51. solve the proportion. Start with cross-multiplying

$x^2 - 5x + 6 = 12$

$x^2 - 5x - 6 = 0$ now factor & solve

63. $b^2 - 4ac$

$k^2 - 4(3)(12)$

$k^2 - 144$

a. one real

$144 - 144 = 0$

$k = \pm 12$

b. two imaginary

$k^2 - 144 < 0$

$|k| < 12$

c. 2 real

$144 - 144 > 0$

$|k| > 12$

66. a) $4^2 - 4(1)(2)$

$16 - 8 > 0$

2 real

graph II.

b) $4^2 - 4(1)(4)$

$16 - 16 = 0$

1 real

graph III.

c) $4^2 - 4(1)(6)$

$16 - 24 < 0$

2 imag.

graph I.

Answers for Lesson 5-8, pp. 289–291 Exercises

1. $1, 3$
2. $-6, -2$
3. $-\frac{7}{2}, 1$
4. $-1, \frac{1}{3}$
5. -5
6. $-\frac{5}{2}, 1$
7. $\frac{3\pm\sqrt{5}}{2}$
8. $-3 \pm \sqrt{14}$
9. $\frac{2 \pm \sqrt{10}}{3}$
10. $-\frac{1}{2}, \frac{3}{4}$
11. $1, 4$
12. $-\frac{5}{3}, \frac{1}{3}$
13. $3 \pm i\sqrt{2}$
14. $1 \pm 2i$
15. $-\frac{3}{2} \pm \frac{i\sqrt{11}}{2}$
16. $-2 \pm i\sqrt{2}$
17. $1 \pm i\sqrt{2}$
18. $-\frac{2}{3} \pm \frac{i\sqrt{26}}{3}$
19. $\frac{5}{2} \pm \frac{i\sqrt{3}}{2}$
20. $\frac{7}{4} \pm \frac{i\sqrt{15}}{4}$
21. $-\frac{1}{15} \pm \frac{i\sqrt{14}}{15}$
22. $-\frac{1}{2}, 3$
23. $\frac{5}{3} \pm \frac{\sqrt{10}}{3}$; $0.61, 2.72$
24. $-\frac{2}{3} \pm \frac{\sqrt{13}}{3}$; $-1.87, 0.54$
25. $-\frac{1}{6}, 1$
26. $\frac{1}{14} \pm \frac{\sqrt{337}}{14}$ $-1.24, 1.38$
27. $-\frac{4}{5} \pm \frac{\sqrt{71}}{5}$ $-2.49, 0.89$
28. $-\frac{1}{2} \pm \frac{\sqrt{23}}{2}$ $-2.90, 1.90$
29. $\frac{5}{4} \pm \frac{\sqrt{33}}{4}$ $-0.19, 2.69$
30. $-\frac{1}{4} \pm \frac{\sqrt{5}}{4}$; $-0.81, 0.31$
31. -4; two, imaginary
32. 36; two, real
33. 0; one, real
34. -223; two, imaginary
35. 169; two, real
36. -116; two, imaginary
37. 1; two, real
38. 0; one, real
39. 0; one, real
40. no
41. $1, 10$
42. $0, 42$
43. $-\frac{3}{2}, \frac{1}{2}$
44. $-3.45, 1.45$
45. $1 \pm i$
46. $-1.70, 4.70$
47. $-7, 7$
48. $-8.47, 0.47$
49. $3 \pm i\sqrt{2}$
50. $-\frac{1}{2}, \frac{3}{2}$
51. $-1, 6$
52. $-5.41, 2.41$

63. a) ± 12 b) $|k| < 12$ c) $|k| > 12$

66. a) 1.1 b) 111 c) 1