Example. Solve the equation $2x^2 + 1 = 7x$ by using the formulas (1).

Solution: By the Subtraction Rule we may write

$$2x^2 - 7x + 1 = 0$$

Since this is now in the type form $ax^2 + bx + c = 0$ we see that $a = 2$, $b = -7$, $c = 1$.

Substituting these values for a, b, and c in the formula, we have

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{7 \pm \sqrt{49 - 8}}{4} = \frac{7 \pm \sqrt{41}}{4}$$

Exercises [A–1]

Solve by the formula, giving irrational answers in simplest radical form:

1. $x^2 + 3x + 1 = 0$
2. $2x^2 + 3 = 8x$
3. $3x^2 - 2 = 11x$
4. $9x = 4x^2 + 2$
5. $4y^2 = 3 - 13y$
6. $18z^2 + 44z = 45$
7. $\frac{2}{x} - \frac{1}{3x+4} = \frac{1}{4}$
8. $\frac{2x}{x+1} - \frac{x+1}{x} = 0$

Solve by the formula, giving irrational answers to the nearest hundredth:

9. $16y^2 - 8y - 1 = 0$
10. $x^2 + 24x = 36$
11. $x^2 + 5x + 3 = 0$
12. $12x^2 + 6x = 5$
13. $5x^2 - 7x - 2 = 0$
14. $x^2 = 3x + 6$
15. $2y^2 - 1.6y - 1.2 = 0$

Exercises [A–2]

Solve by the formula, giving irrational answers in simplest radical form:

1. $z^2 + 2z - 1 = 0$
2. $5k^2 = 11k + 3$
3. $7y^2 = 5 - 6y$
4. $3x^2 - 10x = 3$
5. $6x^2 + 10 = 19x$
6. $x = \frac{7}{x-4}$
7. $\frac{2}{z+2} - \frac{1}{z-4} = 2$

Solve by the formula, giving irrational answers to the nearest hundredth:

8. $x^2 - x - 3 = 0$
9. $4z^2 - 16z + 13 = 0$
10. $2z^2 + 5 = 8z$
11. $5b^2 = 1 + 6b$
12. $15k^2 = 13k - 2$
13. $5y^2 + 6y = .2$
14. $5c^2 - 7c = 1$
15. $x^2 - 50x - 100 = 0$

Page 470 (middle)

1. $\frac{-3 \pm \sqrt{5}}{2}$
2. $\frac{4 \pm \sqrt{10}}{2}$
3. $\frac{11 \pm \sqrt{145}}{6}$
4. $\frac{1}{4}$, 2
5. $\frac{-13 \pm \sqrt{217}}{8}$
6. $\frac{-22 \pm \sqrt{1294}}{18}$
7. $\frac{8 \pm 4\sqrt{10}}{3}$
8. $1 \pm \sqrt{2}$
9. 0.60, -0.10
10. 1.42, -25.42
11. -4.30, -0.70
12. -0.94, 0.44
13. 1.64, -0.24
14. 4.37, -1.37
15. 1.27, -0.47

Page 470 (bottom)

1. $-1 \pm \sqrt{2}$
2. $\frac{11 \pm \sqrt{181}}{10}$
3. $\frac{-3 \pm 2\sqrt{11}}{7}$
4. $\frac{5 \pm \sqrt{34}}{3}$
5. $\frac{2}{3}$, $\frac{5}{2}$
6. $2 \pm \sqrt{11}$
7. $\frac{5 \pm \sqrt{73}}{4}$
8. 2.30, -1.30
9. 2.87, 1.13
10. 3.22, 0.78
11. 1.35, -0.15
12. $\frac{1}{5}$, $\frac{2}{3}$
13. -1.23, 0.03
14. 1.53, -0.13
15. -1.93, 51.93