Practice

1.

$a = 5,\ b = -11,\ c = 6$

$x = \frac{-(-11) \pm \sqrt{(-11)^2 - 4(5)(6)}}{2(5)} = \frac{11 \pm \sqrt{121-120}}{10}$

$x = \frac{11 \pm \sqrt{1}}{10} = \frac{11 \pm 1}{10}$

$x = \frac{12}{10}, \frac{10}{10}$

$x = \frac{6}{5}, 1$

2.

$a = 8,\ b = -5,\ c = 0$

$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(8)(0)}}{2(8)} = \frac{5 \pm \sqrt{25-0}}{16}$

$x = \frac{5 \pm \sqrt{25}}{16} = \frac{5 \pm 5}{16}$

$x = \frac{10}{16}, \frac{0}{16}$

$x = \frac{5}{8}, 0$

3.

$a = 1,\ b = 4,\ c = 4$

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

$x = \frac{-4 \pm \sqrt{0}}{1} = -4 \pm 0$

$x = -4$

4.

$a = 3,\ b = 10,\ c = -2$

$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(3)(-2)}}{2(3)} = \frac{-10 \pm \sqrt{100-(-24)}}{6}$

$x = \frac{-10 \pm \sqrt{124}}{6} = \frac{-10 \pm 2\sqrt{31}}{6}$

$x = \frac{-10}{6} \pm \frac{2\sqrt{31}}{6}$

$x = \frac{-5 \pm \sqrt{31}}{3}$

5.

$a = 1,\ b = 6,\ c = -2$

$x = \frac{-(6) \pm \sqrt{(6)^2 - 4(1)(-2)}}{2(1)} = \frac{-6 \pm \sqrt{36-(-8)}}{2}$

$x = \frac{-6 \pm \sqrt{44}}{2} = \frac{-6 \pm 2\sqrt{11}}{2}$

$x = \frac{-6}{2} \pm \frac{2\sqrt{11}}{2}$

$x = -3 \pm \sqrt{11}$

6.

$a = -2,\ b = 11,\ c = -12$

$x = \frac{-(11) \pm \sqrt{(11)^2 - 4(-2)(-12)}}{2(-2)} = \frac{-11 \pm \sqrt{121 - (96)}}{-4}$

$x = \frac{-11 \pm \sqrt{25}}{-4} = \frac{-11 \pm 5}{-4}$

$x = \frac{-6}{-4}, \frac{-16}{-4}$

$x = \frac{3}{2}, 4$

7.

1 real solution

$b^2 - 4ac = 0$

8.

2 real solutions

$b^2 - 4ac > 0$

9.

0 real solutions

$b^2 - 4ac < 0$

10.

$a = 5,\ b = -11,\ c = 6$

$b^2 - 4ac$

$(-11)^2 - 4(5)(6) = 121 - 120 = 1$

1 > 0; this equation has 2 real solutions.

11.

$a = 8,\ b = -5,\ c = 0$

$b^2 - 4ac$

$(-5)^2 - 4(8)(0) = 25 - 0 = 25$

25 > 0; this equation has 2 real solutions.

12.

$a = 1,\ b = 6,\ c = 12$

$b^2 - 4ac$

$(6)^2 - 4(1)(12) = 36 - 48 = -12$

-12 < 0; this equation has 0 real solutions.

13.

$a = 1,\ b = 4,\ c = 4$

$b^2 - 4ac$

$(4)^2 - 4(1)(4) = 16 - 16 = 0$

0 = 0; this equation has 1 real solution.

14.

$3x^2 + 10x - 2 = 0$

$a = 3,\ b = 10,\ c = -2$

$b^2 - 4ac$

$(10)^2 - 4(3)(-2) = 100 - (-24) = 124$

$124 > 0$; this equation has 2 real solutions.