

8-2 Solve Quadratics with Quadratic Formula

Solve each equation with the quadratic formula.

1) $x^2 - 6x - 112 = 0$

$a = 1$
 $b = -6$
 $c = -112$

$$\frac{6 \pm \sqrt{(-6)^2 - 4(1)(-112)}}{2(1)}$$

$$\frac{6 \pm \sqrt{484}}{2}$$

$$\frac{6 \pm 22}{2} \left\{ \begin{array}{l} \frac{6+22}{2} = 14 \\ \frac{6-22}{2} = -8 \end{array} \right.$$

2) $2k^2 - k - 10 = 0$

$a = 2$
 $b = -1$
 $c = -10$

$$\frac{1 \pm \sqrt{(-1)^2 - 4(2)(-10)}}{2(2)}$$

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

$$\left\{ \begin{array}{l} \frac{1+9}{4} = 4 \\ \frac{1-9}{4} = -2 \end{array} \right.$$

$\left(\frac{5}{2}, -2 \right)$

3) $x^2 - 7x + 12 = 0$

$a = 1$ $b = -7$ $c = 12$

$$\frac{7 \pm \sqrt{(-7)^2 - 4(1)(12)}}{2(1)}$$

$$\frac{7 \pm \sqrt{11}}{2} = \frac{7 \pm 1}{2}$$

$$\left\{ \begin{array}{l} \frac{7+1}{2} = 4 \\ \frac{7-1}{2} = 3 \end{array} \right.$$

4) $3x^2 + 2x - 40 = 0$

$a = 3$ $b = 2$ $c = -40$

$$\frac{-2 \pm \sqrt{(2)^2 - 4(3)(-40)}}{2(3)}$$

$$\frac{-2 \pm \sqrt{484}}{6} = \frac{-2 \pm 22}{6}$$

$$\left\{ \begin{array}{l} \frac{-2+22}{6} = 4 \\ \frac{-2-22}{6} = -4 \end{array} \right.$$

$\left(\frac{10}{3}, -4 \right)$

5) $6x^2 - 11x + 5 = 0$

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

$$\frac{11 \pm \sqrt{(-11)^2 - 4(6)(5)}}{2(6)}$$

$$\frac{11 \pm \sqrt{11}}{12} = \frac{11 \pm 1}{12}$$

$$\left\{ \begin{array}{l} \frac{11+1}{12} = 1 \\ \frac{11-1}{12} = \frac{10}{12} = \frac{5}{6} \end{array} \right.$$

6) $x^2 - x - 132 = 0$

$a = 1$ $b = -1$ $c = -132$

$$\frac{1 \pm \sqrt{(-1)^2 - 4(1)(-132)}}{2(1)}$$

$$= \frac{1 \pm \sqrt{529}}{2}$$

$$= \frac{1 \pm 23}{2}$$

$$\left\{ \begin{array}{l} \frac{1+23}{2} = 12 \\ \frac{1-23}{2} = -11 \end{array} \right.$$

$$7) 4v^2 + 4v - 35 = 0$$

$$a=4 \quad b=4 \quad c=-35$$

$$\frac{-4 \pm \sqrt{16 - 4(4)(-35)}}{2(4)}$$

$$= \frac{-4 \pm \sqrt{576}}{8}$$

$$= \frac{-4 \pm 24}{8}$$

$$\frac{-4+24}{8} = \frac{20}{8} = \frac{5}{2}$$

$$\frac{-4-24}{8} = \frac{-28}{8} = -\frac{7}{2}$$

$$9) 5b^2 = 10b + 75$$

$$a=5 \quad b=-10 \quad c=-75$$

$$\frac{-10 \pm \sqrt{(-10)^2 - 4(5)(-75)}}{2(5)}$$

$$\frac{-10 \pm \sqrt{1600}}{10}$$

$$\frac{-10+40}{10} = 3$$

$$\frac{-10-40}{10} = -5$$

$$11) 3p^2 - 3p = 7$$

$$a=3 \quad b=-3 \quad c=-7$$

$$\frac{+3 \pm \sqrt{(-3)^2 - 4(3)(-7)}}{2(3)}$$

$$\frac{3 \pm \sqrt{93}}{6}$$

$$8) 3n^2 - 6n = 144$$

$$a=3 \quad b=-6 \quad c=-144$$

$$\frac{6 \pm \sqrt{(-6)^2 - 4(3)(-144)}}{2(3)}$$

$$\frac{6 \pm \sqrt{1764}}{6}$$

$$\frac{6 \pm 42}{6}$$

$$\frac{6+42}{6} = 8$$

$$\frac{6-42}{6} = -6$$

$$10) 7n^2 - 24 = n$$

$$a=7 \quad b=-1 \quad c=-24$$

$$\frac{1 \pm \sqrt{(-1)^2 - 4(7)(-24)}}{2(7)}$$

$$\frac{1 \pm \sqrt{673}}{14}$$

$$12) 4p^2 - 14 = -7p$$

$$a=4 \quad b=7 \quad c=-14$$

$$\frac{-7 \pm \sqrt{49 - 4(4)(-14)}}{2(4)}$$

$$= \frac{-7 \pm \sqrt{273}}{8}$$

$$\frac{273}{3 \times 91}$$