

# Algebra II

7-4

Equations in the  
Quadratic Form

Solve each equation. (pg 324)

$$1a) (x+3)^2 - 5(x+3) + 4 = 0$$

$$\underline{(x+3)(x+3)} - \underline{5x} - \underline{15} + \underline{4} = 0$$

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

$$(x+2)(x-1) = 0$$

$$\{-2, 1\}$$

$$y^2 - 5y + 4 = 0$$

$$(y-4)(y-1) = 0$$

$$(x+3)^2 - 5(x+3) + 4 = 0$$

$$((x+3) - 4)((x+3) - 1) = 0$$

$$(x-1)(x+2) = 0$$

$$\{1, -2\}$$

$$1b) (2x-1)^2 - 5(2x-1) + 4 = 0$$

$$\begin{aligned} & ((2x-1) - 4) \times ((2x-1) - 1) = 0 \\ & (2x-5)(2x-2) = 0 \\ & \left\{ \frac{5}{2}, 1 \right\} \end{aligned}$$

$$\begin{aligned} x^2 &= \frac{-(-5) \pm \sqrt{25 - 4(1)(4)}}{2(1)} \quad \leftarrow \text{or} \\ x^2 &= \frac{5 \pm \sqrt{9}}{2} = \frac{5 \pm 3}{2} = 4, 1 \\ x^2 &= 4 \text{ or } x^2 = 1 \end{aligned}$$

$$1c) x^4 - 5x^2 + 4 = 0$$

$$\begin{aligned} & (x^2 - 4)(x^2 - 1) = 0 \\ & (x+2)(x-2)(x+1)(x-1) = 0 \\ & \{ \pm 2, \pm 1 \} \end{aligned}$$

or

$$\begin{aligned} x^2 &= 4 & x^2 &= 1 \\ |x| &= \sqrt{4} & |x| &= \sqrt{1} \\ & \{ \pm 2, \pm 1 \} \end{aligned}$$

$$13) \left(\frac{1+x}{2}\right)^2 - 3\left(\frac{1+x}{2}\right) = 18$$

$$\left(\frac{1+x}{2}\right)^2 - 3\left(\frac{1+x}{2}\right) - 18 = 0$$

$$\left(\frac{1+x}{2} + 3\right)\left(\frac{1+x}{2} - 6\right) = 0$$

$$\frac{1+x}{2} = -3 \quad ; \quad \frac{1+x}{2} = 6$$

$$1+x = -6 \quad 1+x = 12$$

$$x = -7 \quad x = 11$$

$$\{-7, 11\}$$

$$17) x - 10 = 3\sqrt{x}$$

$$x - 3\sqrt{x} - 10 = 0$$

$$(\sqrt{x} + 2)(\sqrt{x} - 5) = 0$$

$$\sqrt{x} = -2 \quad \sqrt{x} = 5$$

$$\emptyset \quad x = 25$$

$$\{25\}$$

Solve each equation. Approximate real solutions to the nearest hundredth.

$$21) 3|x|^2 = 7|x| + 5$$

$$3|x|^2 - 7|x| - 5 = 0$$

$$|x| = \frac{-(-7) \pm \sqrt{49 - 4(3)(-5)}}{2(3)}$$

$$|x| = \frac{7 \pm \sqrt{49 + 60}}{6} = \frac{7 \pm \sqrt{109}}{6}$$

$$|x| = 2.91 \text{ or } |x| = -0.57$$

$$\{ \pm 2.91 \} \quad \emptyset$$



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