Section 9.3 Solving Equations by Using Quadratic Methods

# Objective 1: Solving Equations That are Quadratic in Form

In section 6.6, we factored polynomial expressions that were quadratic in form or “disguised quadratics.” In this section, we will solve equations that are quadratic in form by using the methods we have learned for solving quadratic equations.

Solve the equation. Give the answers in exact form using simplified radicals and $i$ as needed.

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| --- | --- |
| a. $x^{4}+x^{2}-12=0$ | b. $n^{4}-16=0$ |

|  |  |
| --- | --- |
| c. $a^{\frac{2}{3}}-4a^{\frac{1}{3}}+3=0$ |  |

# Objective 2: Solving Equations That Lead to Quadratic Equations

In previous sections we solved radical and rational equations. In some cases, these equations led to quadratic equations that could be solved by factoring. We revisit these types of equations now that we have learned other methods for solving quadratic equations.

Recall that when solving a radical or rational equation, all possible solutions must be checked using the original equation to see if any of the solutions are extraneous.

Solve the equation. Give exact answers using simplified radicals and $i$ as needed.

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| --- | --- |
| a. $x-2\sqrt{x}-3=0$ | b. $\frac{5}{w^{2}-3w+2}=\frac{3w}{w-1}-\frac{w}{w-2}$ |

**Objective 3: Solving Polynomial Equations by Factoring by Grouping**

In section 6.5, we learned how to factor polynomial expressions by grouping. We will now apply this technique to solving polynomial equations.

Solve the equation. Give the answers in exact form using simplified radicals and $i$ as needed.

|  |  |
| --- | --- |
| a. $x^{3}-x^{2}-5x+5=0$ | b. $n^{3}+3n^{2}+2n+6=0$ |