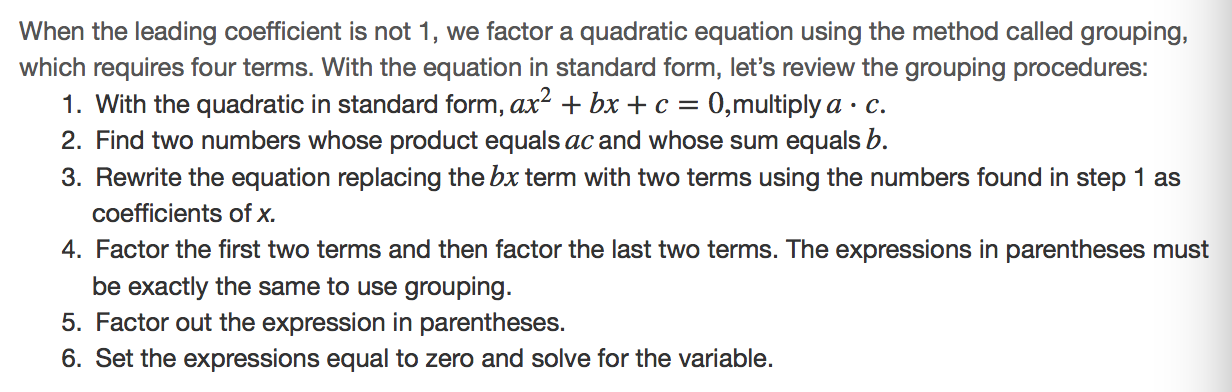
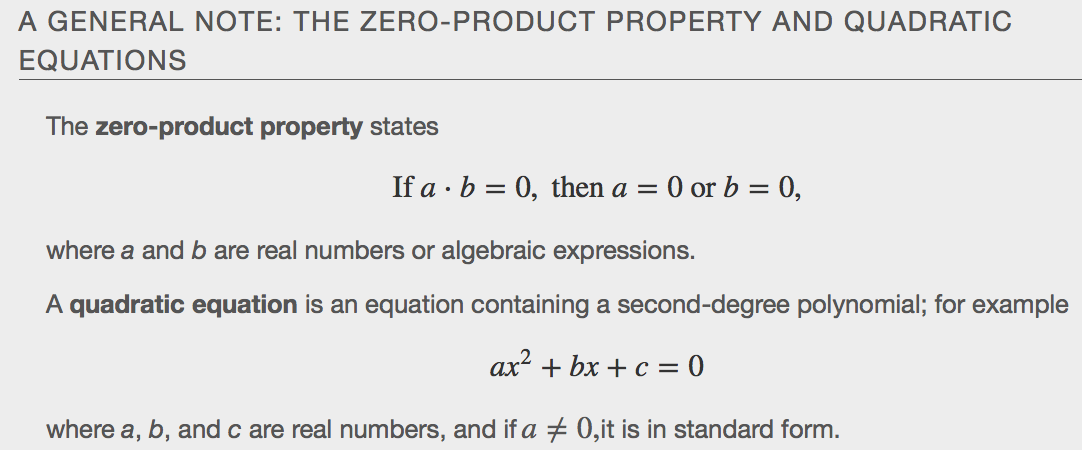
**2.5 – Quadratic Equations**

**Solving Quadratic Equations By Factoring**

**\*\*** This method is useful only if the quadratic expression can be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Factoring means finding expressions that can be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ together to give the expression on one side of the equation.\*\*





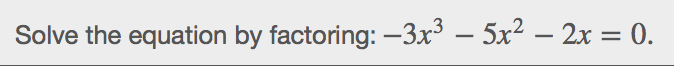
**Examples**

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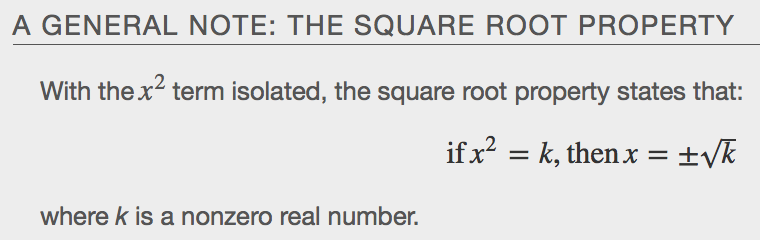
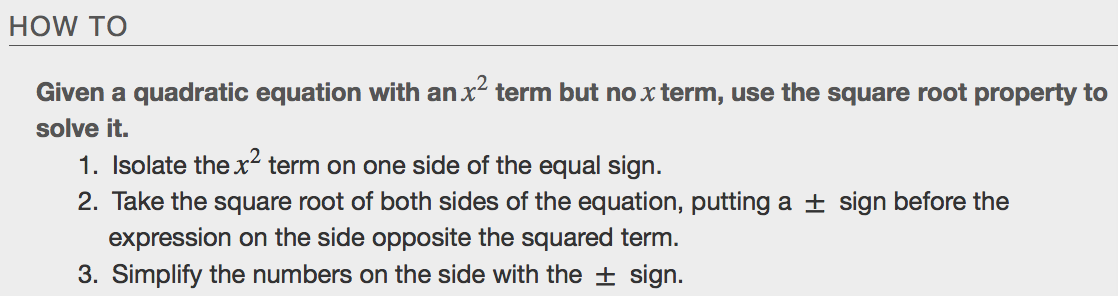
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**Using the Square Root Property**

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**Examples**

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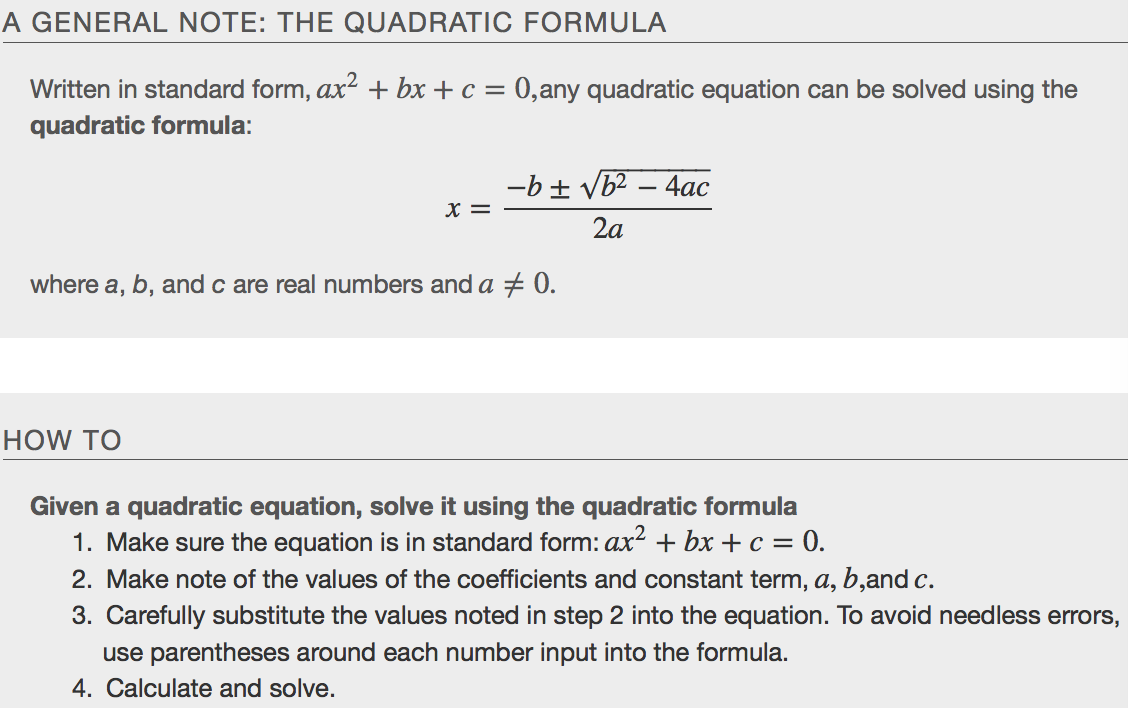
**Completing the Square**

Not all quadratic equations can be factored or can be solved in their original form using the square root property. In these cases, we may use a method for solving a quadratic equation known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Using this method, we add or subtract terms to both sides of the equation until we have a perfect square trinomial on one side of the equal sign. We then apply the square root property. To complete the square, the leading coefficient, *a*, must equal \_\_\_\_\_\_\_\_\_. If it does not, then divide the entire equation by *a*. Then, we can use the following procedures to solve a quadratic equation by completing the square.

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**Using the Quadratic Formula**

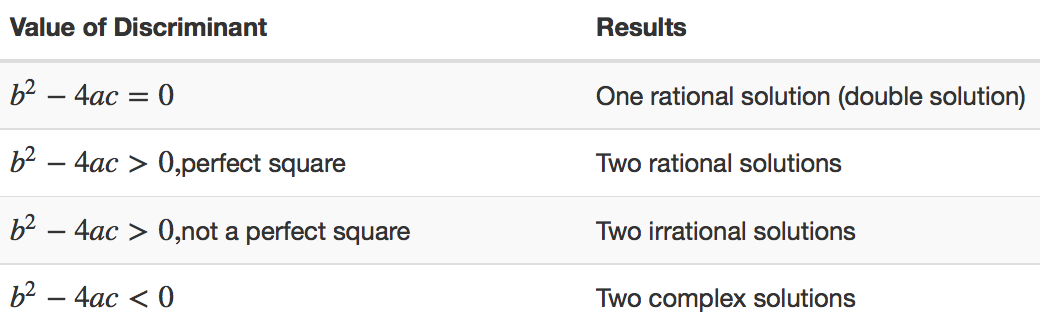
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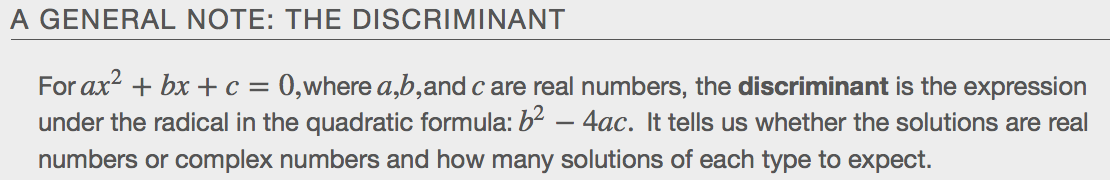
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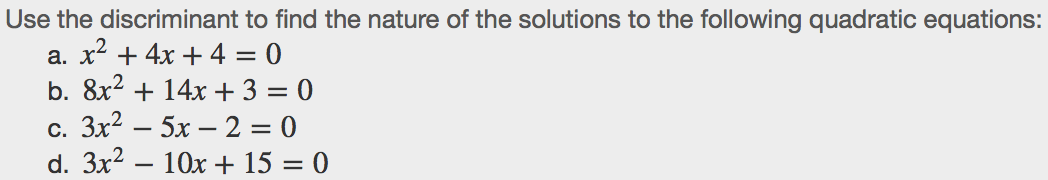
**The Discriminant**

The quadratic formula not only generates the solutions to a quadratic equation, it tells us about the nature of the solutions when we consider the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, or the expression under the radical, *b*2−4*ac*.The discriminant tells us whether the solutions are real numbers or complex numbers, and how many solutions of each type to expect. [Table](http://cnx.org/contents/E6wQevFf@5.241:ABOAASP-@10/Quadratic-Equations#Table_02_05_01) relates the value of the discriminant to the solutions of a quadratic equation.

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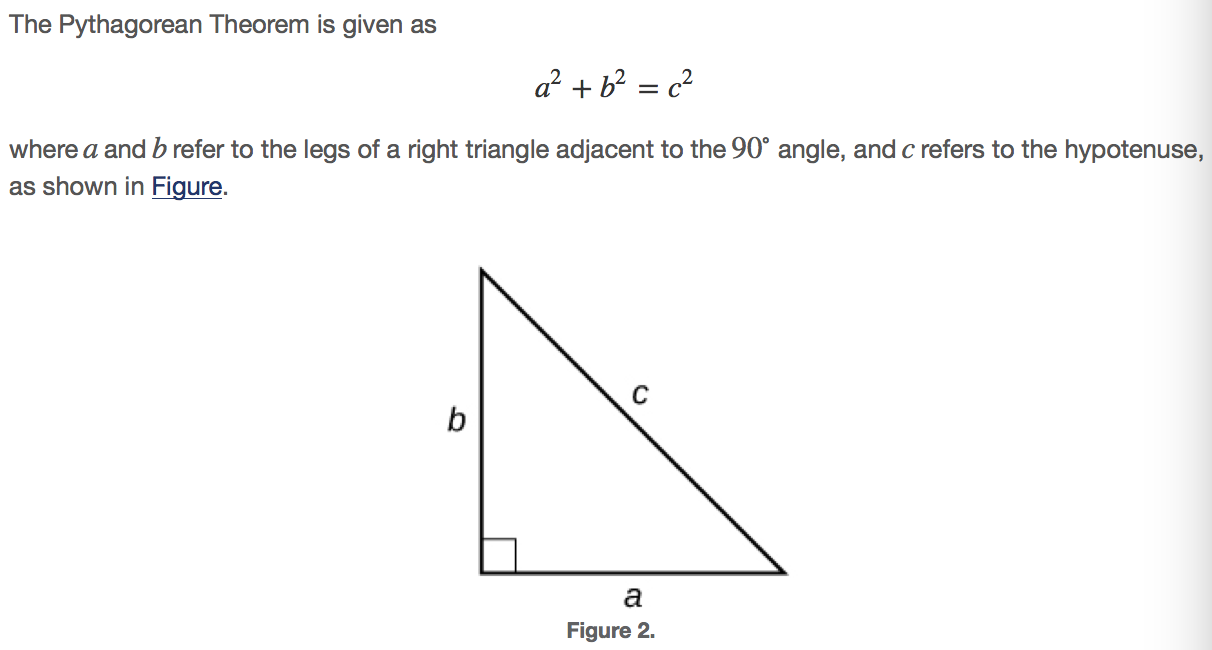
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**Examples**

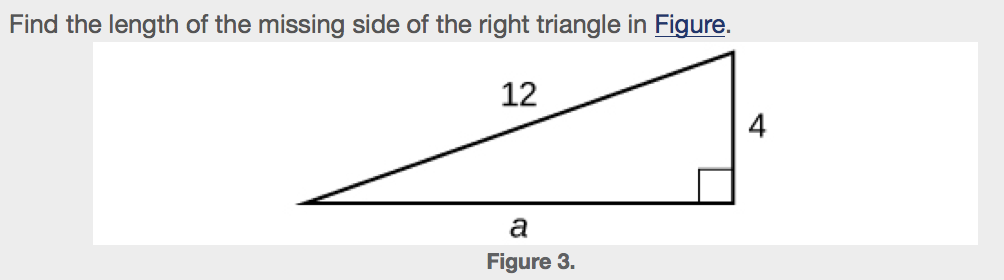
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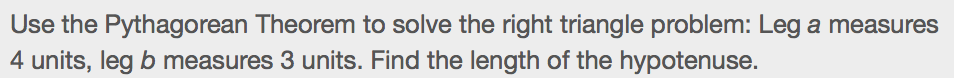
**Using the Pythagorean Theorem**

One of the most famous formulas in mathematics is the Pythagorean Theorem. It is based on a right triangle, and states the relationship among the lengths of the sides as*a*2+*b*2=*c*2, where *a* and *b* refer to the legs of a right triangle adjacent to the 90°angle, and *c* refers to the hypotenuse. It has immeasurable uses in architecture, engineering, the sciences, geometry, trigonometry, and algebra, and in everyday applications.

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**Examples**

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