

MA 22000, Lesson 7 Notes
Lessons 5.6 (page 350), 8.1 (page 508)

Zero-Factor Property: Let a and b represent numbers, variables, or an algebraic expression. If $ab = 0$, then $a = 0$ or $b = 0$. This property also applies to more than two factors.

Definition: A Quadratic Equation (in general form) can be written as $ax^2 + bx + c = 0$, where a , b , and c are real numbers with $a \neq 0$.

Using Factoring to Solve Polynomial Equations (including some Quadratic Equations):

1. Put the equation in general form (equal to zero)
2. Factor the polynomial.
3. Using the zero-factor property, each factor (with a variable) equals zero.
4. Solve each.

Ex 1: Solve: $6x^2 - 11x - 10 = 0$

Ex 2: Solve: $25a^2 + 30a + 9 = 0$

Ex 3: Solve: $(x - 8)(x - 6) = 8$

Ex 4: Solve: $3n^2 - 15n = 0$

Ex 5: $45 + 12u - u^2 = 0$

Ex 6: $50x^3 - 18x = 0$

You can solve other polynomial equations similarly by using the zero-factor property and factoring.

Ex 7: $x^3 + x^2 - 4x - 4 = 0$

Ex 8: $x^2(4x^2 - 13) = -9$

Note: Many of you may be familiar with the quadratic formula that could be used to solve a quadratic equation of the form $ax^2 + bx + c = 0$. It is $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. This formula can be used for solving all or part of the previous examples.