COMPLETING THE SQUARE

STEP 1: Put equation in standard form (equal to zero)

STEP 2: Divide each term by the coefficient of x^2

STEP 3: Move the constant to the right side.

STEP 4: Multiply coefficient of x by ½.

Square the result, and add it to both sides of equation.
(Note: MIDDLE TERM DOES NOT CHANGE)

STEP 5: Rewrite left side as the square of a binomial.
Combine terms on the right side.

STEP 6: Take the square root of both sides.
(Note: REMEMBER THE $\pm$ SIGN.)

STEP 7: Move the constant to the right side.

STEP 8: Separate into two answers and combine terms.

EXAMPLE

$2x^2 = -5x + 3$

STEP 1: $2x^2 + 5x - 3 = 0$

STEP 2: $x^2 + \frac{5}{2}x - \frac{3}{2} = 0$

STEP 3: $x^2 + \frac{5}{2}x = \frac{3}{2}$

STEP 4: $\frac{5}{2} * \frac{1}{2} = \frac{5}{4}$; $\left(\frac{5}{4}\right)^2 = \frac{25}{16}$

$x^2 + \frac{5}{2}x + \frac{25}{16} = \frac{3}{2} + \frac{25}{16}$

STEP 5: $\left(x + \frac{5}{4}\right)^2 = \frac{24}{16} + \frac{25}{16} = \frac{49}{16}$

STEP 6: $x + \frac{5}{4} = \pm\frac{7}{4}$

STEP 7: $x = \pm\frac{7}{4} - \frac{5}{4}$

STEP 8 $= +\frac{7}{4} - \frac{5}{4}$, $- \frac{7}{4} - \frac{5}{4}$

$= \frac{2}{4}$, $- \frac{12}{4}$

$x = \frac{1}{2}$, $- 3$