

Ex #7 $4(x+5)^2 - 49 = 0$

$4(x+5)^2 = 49$

$\sqrt{(x+5)^2} = \sqrt{\frac{49}{4}}$

$x+5 = \pm \frac{7}{2}$

$x = \pm \frac{7}{2} - 5$

$x = \frac{7}{2} - 5$ $x = -\frac{7}{2} - 5$

$x = \frac{7}{2} - \frac{10}{2}$ $x = -\frac{7}{2} - \frac{10}{2}$

$x = -\frac{3}{2}$ $x = -\frac{17}{2}$

Ex #8 $5(x+1)^2 - 8 = 0$

$5(x+1)^2 = 8$

$\sqrt{(x+1)^2} = \sqrt{\frac{8}{5}}$

$x+1 = \pm \frac{2\sqrt{2}}{\sqrt{5}}$

$x+1 = \pm \frac{2\sqrt{10}}{5}$

$x = -1 \pm \frac{2\sqrt{10}}{5}$

We'll finish the rest of notes after break!!

Completing the Square

If the instructions include "complete the square"

- ① Divide everything by the leading coefficient, then move the constant, and + \square .
- ② Use $(\frac{b}{2})^2$ to figure out what goes in \square .
- ③ Factor left & simplify right.
- ④ Solve by taking square roots.

Ex #9 Solve $4x^2 + 16x - 5 = 0$ by completing the square.

$x^2 + 4x - \frac{5}{4} = 0$

$x^2 + 4x + \square = \frac{5}{4} + \square$

$(\frac{4}{2})^2 = 2^2 = 4$

~~$\begin{matrix} 4 & & 4 \\ 2 & & 2 \end{matrix}$~~

$(x+2)^2 = \frac{5}{4} + \frac{16}{4}$

$\sqrt{(x+2)^2} = \sqrt{\frac{21}{4}}$

$x+2 = \pm \sqrt{\frac{21}{4}}$

$x+2 = \pm \frac{\sqrt{21}}{2}$

$x = -2 \pm \frac{\sqrt{21}}{2}$

Ex#10 $\frac{5x^2}{5} - \frac{30x}{5} - \frac{3}{5} = 0$

$x^2 - 6x - \frac{3}{5} = 0$

$x^2 - 6x + \boxed{9} = \frac{3}{5} + \boxed{9}$
 $(x-3)^2 = \frac{3}{5} + 9(\frac{5}{5})$
 $= \frac{3}{5} + \frac{45}{5}$

$(\frac{-6}{2})^2 = 9$

$(x-3)^2 = \sqrt{\frac{48}{5}}$

$x - 3 = \pm \sqrt{\frac{48}{5}}$

$x = 3 \pm \sqrt{\frac{48}{5}}$

$x = 3 \pm \frac{4\sqrt{3}}{\sqrt{5}}$

$\sqrt{48} = \sqrt{16} \sqrt{3}$
 $= 4\sqrt{3}$

Ex#11 $2x^2 - 6x - 1 = 0$

$x^2 - 3x - \frac{1}{2} = 0$

$\frac{9}{4}$
 $\frac{-3}{2} \quad \frac{-3}{2}$

$x^2 - 3x + \boxed{\frac{9}{4}} = \frac{1}{2} + \boxed{\frac{9}{4}}$

$(x - \frac{3}{2})^2 = \frac{2}{4} + \frac{9}{4}$

$(x - \frac{3}{2})^2 = \frac{11}{4}$

$x - \frac{3}{2} = \pm \sqrt{\frac{11}{4}}$

$x = \frac{3}{2} \pm \frac{\sqrt{11}}{2}$

$(\frac{-3}{2})^2 = \frac{9}{4}$

Ex#12 $2x^2 - 4x + 7 = 0$

$x^2 - 2x + \frac{7}{2} = 0$

$x^2 - 2x + \boxed{1} = -\frac{7}{2} + \boxed{1}$

$(x-1)^2 = -\frac{5}{2}$

$x-1 = \pm \sqrt{-\frac{5}{2}}$

$x-1 = \pm i \frac{\sqrt{5}}{\sqrt{2}}$

$x = 1 \pm i \frac{\sqrt{5}}{\sqrt{2}}$