Lecture 2

Friday, September 5, 2025 8:57 AM

Goals: solving quadratic equations using

- Completing the square
- Quadratic formula

Facts to memorize:

- $ab = 0$ if and only if $a = 0$ or $b = 0$
- $a^2 \geq 0$ for any real number a
- $a^2 = b$, where $b \geq 0$, if and only if $a = \pm\sqrt{b}$ (then discuss completing the square)
- $(a \pm b)^2 = a^2 \pm 2ab + b^2$
- $a^2 - b^2 = (a - b)(a + b)$

Examples: Solve for $x \in R$

1) $(x - 2)(x + 3) = 0$
2) $(x - 2)^2 + (x + 3)^2 = 0$
3) $x^2 + 4x + 3 = 0$
4) $x^2 - 4x + 4 = 0$
5) $\frac{x-2}{3} + \frac{x}{4} = \frac{1}{2}$
6) $\frac{x-1}{2} + \frac{2}{x} = 2$
7) $\sqrt{x+5} = x + 1$