Equations in LaTeX

Equation 1

$$\begin{aligned} x &= \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \\ &= \frac{-2 \pm \sqrt{2^2 - 4 \cdot (1) \cdot (3)}}{2 \cdot (1)} \\ &= \frac{-2 \pm \sqrt{4 - 12}}{2} \end{aligned}$$

Equation 2

$$\begin{aligned} \varphi_\sigma^\lambda A_t &= \sum_{\pi \in C_t} sgn(\pi) \varphi_\sigma^\lambda \varphi_\pi^\lambda \\ &= \sum_{\tau \in C_{\sigma t}} sgn(\sigma^{-1}\tau\sigma) \varphi_\sigma^\lambda \varphi_{\sigma^{-1}\tau\sigma}^\lambda \\ &= A_{\sigma t} \varphi_\sigma^\lambda \end{aligned}$$