# Some Title

## And Maybe a Subtitle

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# Contents

# A Title

Contents of the slide

# Roots of $f^n(x)$

$f(x) = (x-\gamma)^2 + \gamma + m$

- The roots of $f(x)$ are $\gamma \pm \sqrt{-m-\gamma}$
- If $\alpha$ is a root of $f^n(x)$, then $\gamma \pm \sqrt{\alpha - m - \gamma}$ are roots of $f^{n+1}(x)$

## Observation

*For $n > 0$, the roots of $f^n(x)$ are, with $n$ radicals:*

$$\gamma \pm \sqrt{-m \pm \sqrt{-m \pm \sqrt{-m \pm \ldots \sqrt{-m-\gamma}}}}$$

# Roots of $f^n(x)$

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For notational convenience, define $\beta : \Sigma^* \to \mathbb{C}$ where

$$\begin{aligned} \beta_\epsilon &= -\gamma \\ \beta_{0s} &= \sqrt{-m + \beta_s} \\ \beta_{1s} &= -\sqrt{-m + \beta_s} \end{aligned}$$

For $n > 0$, the roots of $f^n(x)$ are exactly $\{\, \gamma + \beta_s \mid s \in \Sigma^n \,\}$.