

## 5. minitest

Matematika B2, LS 2024/25

22. 4. 2025

Vypočtěte integrál

$$\int_0^1 \frac{(x-1)^2}{\sqrt{x}} dx$$

$$= \int_0^1 \frac{x^2 - 2x + 1}{\sqrt{x}} dx = \int_0^1 \frac{x^2}{x^{\frac{1}{2}}} dx - 2 \cdot \int_0^1 \frac{x}{x^{\frac{1}{2}}} dx + \int_0^1 x^{-\frac{1}{2}} dx$$

$$= \int_0^1 x^{\frac{3}{2}} dx - 2 \cdot \int_0^1 x^{\frac{1}{2}} dx + \int_0^1 x^{-\frac{1}{2}} dx =$$

$$= \left[ \frac{x^{\frac{5}{2}}}{\frac{5}{2}} \right]_0^1 - 2 \cdot \left[ \frac{x^{\frac{3}{2}}}{\frac{3}{2}} \right]_0^1 + \left[ \frac{x^{\frac{1}{2}}}{\frac{1}{2}} \right]_0^1$$

$$= \frac{2}{5} - 2 \cdot \frac{2}{3} + 2 = \frac{6 - 20 + 30}{15} = \frac{16}{15}$$