

Řešení DÚ
6. sada

Integrály na metodu per partes.

(f)

$$\begin{aligned}\int x^2 \arccos x \, dx &= \frac{1}{3}x^3 \arccos x - \frac{1}{3} \int \frac{-x^3}{\sqrt{1-x^2}} \, dx = * \\ \int \frac{-x^3}{\sqrt{1-x^2}} \, dx &= \int \frac{-2x}{2\sqrt{1-x^2}} x^2 \, dx = x^2 \sqrt{1-x^2} - \int 2x \sqrt{1-x^2} \, dx \\ &= x^2 \sqrt{1-x^2} + \frac{2}{3}(1-x^2)^{\frac{3}{2}} + c = \frac{1}{3}(2+x^2)\sqrt{1-x^2} + c \\ * &= \frac{1}{3}x^3 \arccos x - \frac{1}{9}(2+x^2)\sqrt{1-x^2} - \frac{c}{3}, \quad c \in \mathbb{R}, \quad x \in (-1, 1)\end{aligned}$$