

MAT 01901 Opgave E31

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Vi skal finde integralet

$$\int_{\frac{\pi}{6}}^{\frac{\pi}{2}} \frac{\cos x}{\sqrt{\sin x}} dx$$

Substitutionen $t = \sin x$ giver $dt = \cos x dx$, således at

$$\begin{aligned} \int_{\frac{\pi}{6}}^{\frac{\pi}{2}} \frac{\cos x}{\sqrt{\sin x}} dx &= \int_{\frac{1}{2}}^1 \frac{1}{\sqrt{t}} dt = \int_{\frac{1}{2}}^1 t^{-\frac{1}{2}} dt \\ &= \left[2t^{\frac{1}{2}} \right]_{\frac{1}{2}}^1 = 2 - 2\sqrt{\frac{1}{2}} = 2 - \sqrt{2} \end{aligned}$$