

Evaluate: $\int \left(3x^2 \tan \frac{1}{x} - x \sec^2 \frac{1}{x} \right) dx$

Answer: $\int \left(3x^2 \tan \frac{1}{x} - x \sec^2 \frac{1}{x} \right) dx$

$$\begin{aligned} &= \int 3x^2 \tan \frac{1}{x} dx - \int x \sec^2 \frac{1}{x} dx \\ &= \tan \frac{1}{x} x^3 - \int \left(\sec^2 \frac{1}{x} \right) \left(-\frac{1}{x^2} \right) x^3 dx - \int x \sec^2 \frac{1}{x} dx \\ &= x^3 \tan \frac{1}{x} + c \end{aligned}$$