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Evaluate $\int_0^1 \mathrm{e}^{-3x}\, x^2\, dx$

HINT:

Use integration by parts:

$$\int f(x)g(x)\, dx = F(x)g(x) - \int F(x)g'(x)\, dx + C, \text{ such that } F(x) = \int f(x)\, dx$$

Follow LIATE rule

According to LIATE rule, $f(x) = \mathrm{e}^{-3x}$ and $g(x) = x^2$