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1) Calcule as integrais por partes

a) $\int dx \, x e^3$

b) $\int x \sin(5x) dx$

c) $\int x \ln(x) dx$

d) $\int dt \, t e^{4t}$

e) $\int dx \, x e^{x^2}$

f) $\int \sin x \, dx$

I. $\frac{x e^{3x}}{3} - \frac{e^{3x}}{9}$

II. $-\frac{x \cos(5x)}{5} + \frac{\sin(5x)}{25}$

III. $\frac{\ln(x) \cdot x^3}{3} - \frac{x^3}{9}$

IV. $\frac{t e^{4t}}{4} - \frac{e^{4t}}{16}$

V. $x^2 e^x - 2x e^x + 2e^x$

VI. $\frac{\sin(x) \cdot e^x - \cos(x) \cdot e^x}{2}$