Ex 1. Find $f(x)$ by solving the initial value problem.

a) $f'(x) = e^x + x^5 + 3$ and $f(0) = 0$

b) $f'(x) = 4x^3 - \dfrac{3}{x^2} + \pi$ and $f(1) = \pi$

Ex 2. Solve the following indefinite integrals using u-substitution.

a) $\displaystyle\int 2(2x + 4)^5 \, dx$

b) $\displaystyle\int (x + 1)\sqrt{x^2 + 2x} \, dx$

c) $\int \dfrac{x^2}{x^3 - 3}\, dx$

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

e) $\int \dfrac{\ln(x)}{x}\, dx$