

(Task 3, problem 5)

$$\int_0^1 \ln x dx = -1 \quad (x \ln x - x + C)$$

$$\int u(x) dv(x) = u(x) \cdot v(x) - \int v(x) \cdot du(x)$$

$$u = \ln x, dv = dx, du = \frac{1}{x} dx, v = x$$

$$\int \ln x dx = x \ln(x) - \int dx$$

$$\int dx \rightarrow \int 1 dx = x$$

$$\int \ln x = x \ln x - x + C$$

$$\int_0^1 \ln x \cdot dx = (x \cdot \ln x - x) \Big|_0^1$$

$$F(1) = -1$$

$$F(0) = 0$$

$$I = -1 - 0 = -1$$