[10.00.19]

$$I_1 = \int_0^2 5x^3\,dx = \left[5 \cdot \frac{x^4}{4}\right]_0^2 = 5 \times \frac{2^4}{4} = 20$$

$$I_2 = \int_0^1 \frac{x}{x^2+1}\,dx = \left[\frac{1}{2}\ln(x^2+1)\right]_0^1 = \frac{1}{2}\ln(2) = \ln(\sqrt{2})$$

$$I_3 = \int_{-1}^1 x^2(x^3+3)\,dx = \int_{-1}^1 (x^5+3x^2)\,dx = \left[\frac{x^6}{6} + 3 \cdot \frac{x^3}{3}\right]_{-1}^1$$

$$= \frac{1}{6} + \frac{3}{3} - \left(\frac{1}{6} - \frac{3}{3}\right)$$

$$= \frac{1}{6} + 1 - \frac{1}{6} + 1$$

$$I_3 = 2$$

$$I_4 = \int_0^1 x\,e^{2x}\,dx$$

<u>IPP</u> : $u = x$ donc $u' = 1$

$v' = e^{2x}$ on choisit $v = \frac{1}{2}e^{2x}$

donc $I_4 = \left[\frac{x}{2}e^{2x}\right]_0^1 - \int_0^1 \frac{1}{2}e^{2x}\,dx$

$$= \frac{1}{2}e^2 - \left[\frac{1}{4}e^{2x}\right]_0^1$$

$$= \frac{e^2}{2} - \frac{e^2}{4} + \frac{1}{4}$$

$$= \frac{e^2}{4} + \frac{1}{4}$$

$$I_4 = \frac{e^2+1}{4}$$