c) $\int_1^2 \int_{-1}^{2} (12x^3 - 8xy^2)\,dy\,dx = 99$

$1 \le x \le 2$
$-1 \le y \le 2$

$\int_{-1}^{2} (12x^3)\,dy - \int_{-1}^{2} (8xy^2)\,dy \to 12x^3 y \Big|_{-1}^{2} - 8x \cdot \frac{y^3}{3} \Big|_{-1}^{2} \to$

$36x^3 - 8x \cdot 3 \to 36x^3 - 24x$ //

$\int_1^2 36x^3 - 24x\,dx \to \int_1^2 36x^3 dx - \int_1^2 24x\,dx \to 36 \int_1^2 x^3 dx - 24 \int_1^2 x\,dx \to$

$36 \cdot \frac{x^4}{4} \Big|_1^2 - 24 \cdot \frac{x^2}{2} \Big|_1^2$

$135 - 36 = 99$ //

② $\int_1^2 \int_1^{x^2} xy^3\,dy\,dx = 25 \cdot \frac{1}{5}$

$x \cdot \int_1^{x^2} y^3\,dy \to x \cdot \frac{y^4}{4} \Big|_1^{x^2} \to x \cdot \frac{x^8}{4} - \frac{1}{4} \to$

$\int_1^2 x \cdot \frac{x^8}{4} - \frac{1}{4}\,dx \to \int_1^2 \frac{x^9}{4} - \frac{x}{4}\,dx \to \frac{1}{4} \int_1^2 x^9\,dx \int_1^2 \frac{x}{4}\,dx \to$

$\frac{x^{10}}{10} \Big|_1^2 - \frac{3}{8} \to \frac{126}{5}$

$1 \le x \le 2$
$1 \le y \le x^2$