

$$\iint_D (xy + 4x^2) dx dy =$$

$$= \int_{-2}^0 dx \int_{x^2+3x+3}^{x+3} (xy + 4x^2) dy =$$

$$= \int_{-2}^0 dx \left(x \frac{y^2}{2} + 4x^2 y \right) \Big|_{y=x^2+3x+3}^{y=x+3} =$$

$$= \int_{-2}^0 \left[x \frac{(x+3)^2}{2} + 4x^2(x+3) - x \frac{(x^2+3x+3)^2}{2} - 4x^2(x^2+3x+3) \right] dx = \dots$$

$$D: y = x+3, y = x^2+3x+3$$

$$(x+3/2)^2 + 3/4$$

$$x+3 = x^2+3x+3$$

$$0 = x^2+2x = x(x+2)$$

$$\begin{cases} x=0 \\ y=3 \end{cases} \vee \begin{cases} x=-2 \\ y=1 \end{cases}$$

