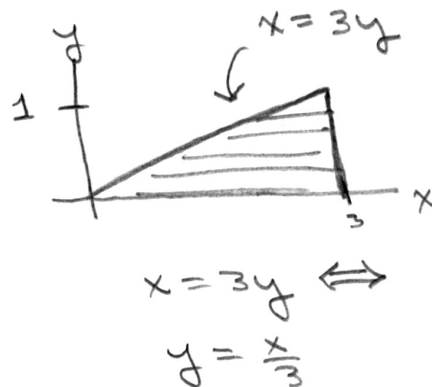


Calculate the integral

$$\int_0^1 \int_{3y}^3 e^{x^2} dx dy.$$

Region of integration



Interchanging the
order of integration
we get

$$\int_0^3 \int_0^{\frac{x}{3}} e^{x^2} dy dx =$$

$$\int_0^3 \frac{x}{3} e^{x^2} dx = \quad \begin{array}{l} u = x^2 \\ du = 2x dx \end{array}$$

$$\int_0^9 \frac{1}{6} e^u du =$$

$$\frac{1}{6} (e^9 - 1)$$