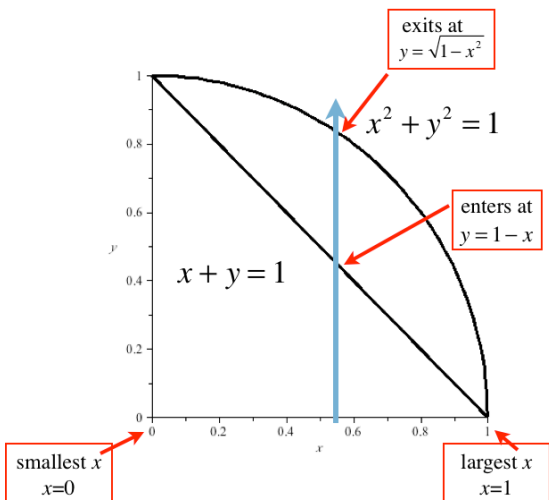


## Math 213 - 12.3 - Limits on Double Integrals

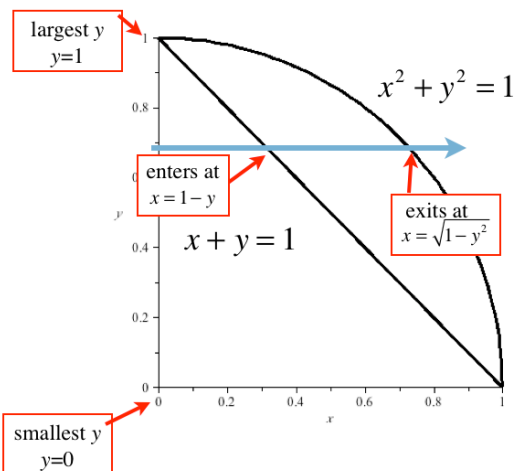
Suppose we wanted to find  $\iint f(x,y) dA$  over the region bounded by the curves  $x + y = 1$  and  $x^2 + y^2 = 1$ .

Suppose we wanted to integrate first with respect to  $y$  and then with respect to  $x$ .



$$\int_{x=0}^{x=1} \int_{y=1-x}^{y=\sqrt{1-x^2}} f(x,y) dy dx$$

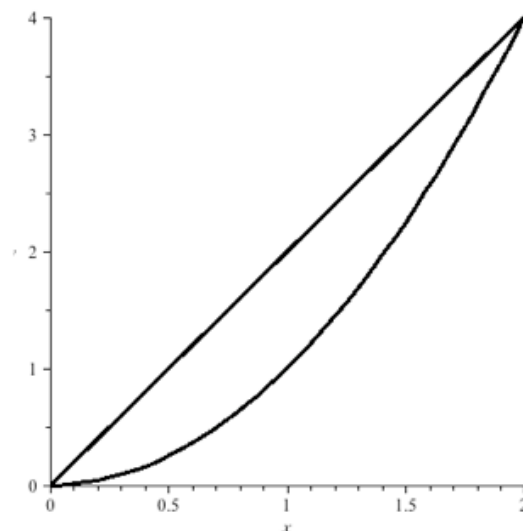
Suppose we wanted to integrate first with respect to  $x$  and then with respect to  $y$ .



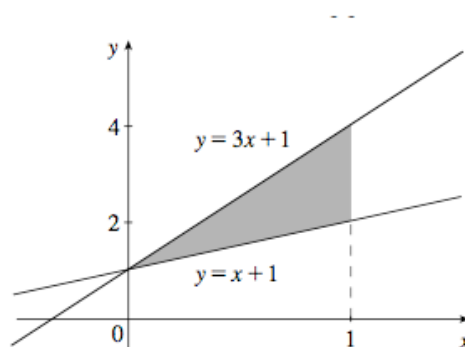
$$\int_{y=0}^{y=1} \int_{x=1-y}^{x=\sqrt{1-y^2}} f(x,y) dx dy$$

**Order Matters!**

Compute  $\iint (4x+2) dA$

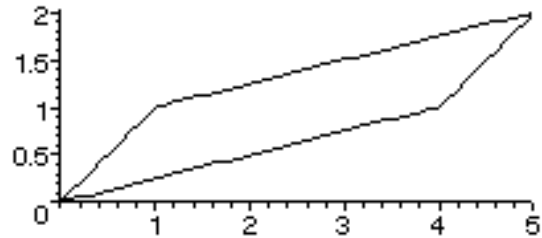


Compute  $\iint e^{x^2} dA$



Fill in the required limit of integration for each of the following double integrals  $\iint_R f(x,y)dA$ , where  $R$  is the region indicated in the accompanying sketch.

1.  $\int_0^1 \int_{[?]}^{4y} f(x,y) dx dy + \int_1^2 \int_{[?]}^{[?]} f(x,y) dx dy$



2.  $\int_0^3 \int_{[?]}^{[?]} f(x,y) dy dx + \int_3^5 \int_{[?]}^{[?]} f(x,y) dy dx$

