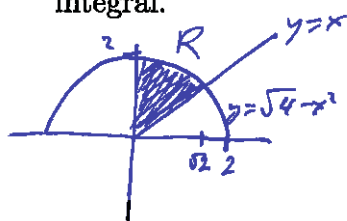


1. Consider the integral

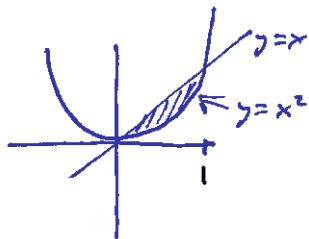
$$\iint_R \frac{1}{1+x^2+y^2} dA = \int_0^{\sqrt{2}} \int_x^{\sqrt{4-x^2}} \frac{1}{1+x^2+y^2} dy dx.$$

Draw the region of integration, R , and then express the integral above as an iterated integral in polar coordinates. DO NOT evaluate the integral.



$$\int_0^{\pi/2} \int_0^2 \frac{1}{1+r^2} r dr d\theta$$

2. An object is shaped like the region between the parabola $y = x^2$ and the line $y = x$, with varying density given by $\rho(x, y) = x + y$. Give an expression for calculating \bar{y} , the y -coordinate of its center of gravity, using iterated integrals. Be sure all limits of integration are specified, but DO NOT evaluate any integrals in your answer.



$$\bar{y} = \frac{\int_0^1 \int_{x^2}^x y(x+y) dy dx}{\int_0^1 \int_{x^2}^x (x+y) dy dx}$$