Limits for double integrals

1. Evaluate $\iint_R x \, dA$, where $R$ is the finite region bounded by the axes and $2y + x = 2$.

Answer:
First we sketch the region.

Next, we find limits of integration. By using vertical stripes we get limits
Inner: $y$ goes from 0 to $1 - x/2$; outer: $x$ goes from 0 to 2.
Thus the integral is
$$\int_0^2 \int_0^{1-x/2} x \, dy \, dx$$

Finally, we compute the inner, then the outer integrals.

Inner: $xy\big|_0^{1-x/2} = x - \frac{x^2}{2}$.
Outer: $\frac{x^2}{2} - \frac{x^3}{6}\big|_0^2 = \frac{2}{3}$. 