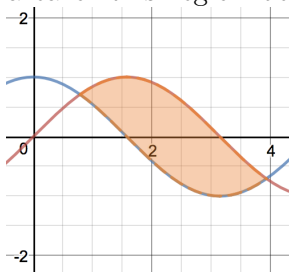
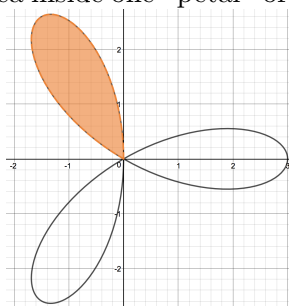


1. Use a double integral to compute the area of this region between the sine and cosine curves:



2. Use a double integral to compute the area inside one “petal” of this flower, formed by $r = 3 \cos 3\theta$:



3. Compute the volume under the graph of $f(x, y) = y^2 \sin x$ defined by the region R : $0 \leq x \leq \pi$, $0 \leq y \leq 1$.

$$\iint_R f(x, y) \, dA =$$

4. Compute the volume under the graph of $f(x, y) = 12 - x^2 - y^2$ defined by the region R : $0 \leq x^2 + y^2 \leq 3$.

$$\iint_R f(x, y) \, dA =$$