



same area

$$\sin^2 z + \cos^2 z = 1$$

$$\Rightarrow \int_0^1 dy (\sin^2 \pi y + \cos^2 \pi y) = 1$$

$$= 2 \int_0^1 dy \sin^2(\pi y) = 1$$

$$\Rightarrow \int_0^1 dy \sin^2(\pi y) = \frac{1}{2}$$