MAC2312: Calculus 2 - Section 3

Quiz 13: 10.4 Areas and Lengths in Polar Coordinates — July 9, 2015

1. Find the area of the region that is bounded by $r = \sqrt{\theta}$ and lies in the region $0 \leq \theta \leq 2\pi$.

   A. π

   B. π^2

   C. π^3

   D. π^4

$$\begin{aligned} A &= \int \frac{1}{2} r^2 \, d\theta \\ &= \int_0^{2\pi} \frac{1}{2} (\sqrt{\theta})^2 \, d\theta \\ &= \frac{1}{2} \int_0^{2\pi} \theta \, d\theta = \pi^2 \end{aligned}$$