

Homework questions for section 11.4, 12.1

Math 104, Fall 2007

Credit is given only if supporting work is shown. Only correct answers receive credit. No partial credit is given.

1. Find the total area inside the *smaller* loop of the limaçon

$$r = \sqrt{2} - 2 \sin \theta.$$

(It is useful to include a rough sketch.)

- A) $\pi - 1$ B) $\pi - 2$ C) $\pi - 3$ D) $2\pi - 3$ E) $2\pi - 4$ F) $2\pi - 5$

2. Find the arc length of the polar curve

$$r = \cos^2(\theta/2).$$

- A) 3 B) π C) $1 + \frac{\pi}{2}$ D) 4 E) $1 + \pi$ F) $2 + \frac{\pi}{2}$

3. Evaluate the series

$$\sum_{n=0}^{\infty} \frac{5 \cdot 2^n}{3^{n+1}}.$$

- A) $\frac{14}{3}$ B) 5 C) $\frac{16}{3}$ D) $\frac{17}{3}$ E) 6 F) $\frac{19}{3}$