MAT 141
Problem Set #9

due in recitation on November 4 or 5, 2004

1. Apostol, section 2.8, # 19, 21, 26, 27
2. Apostol, section 2.13 # 3, 4, 13
3. Compute $\int_a^b \sin x \cos x \, dx$.
4. Consider the two cylinders

$$C_1 = \{(x, y, z) \mid x^2 + z^2 \leq 1\}$$
$$C_2 = \{(x, y, z) \mid y^2 + z^2 \leq 1\}$$

and let $S = C_1 \cap C_2$.

(a) Draw a sketch of S.
(b) What is the shape of the slice of S in the plane $z =$ constant?
(c) Compute the cross section area, $a(z)$ of a slice of S.
(d) Compute the volume of S.