

MATH 166
EXTRA CREDIT 4

1. Show that the volume of an n -dimensional sphere (V_n) of radius R is given by

$$V_n = \begin{cases} \frac{2^{2k+1}(k)!\pi^k}{(2k+1)!} R^{2k+1} & \text{if } n = 2k + 1 \text{ is odd,} \\ \frac{\pi^k}{k!} R^{2k} & \text{if } n = 2k \text{ is even.} \end{cases}$$