Student Name:

SIS ID (starts with letter "e"):

1. Our solution to Example 3.3 is listed below, calculate C_n when $V_0(y)$ takes a constant value V_0.

$$V(x, y) = \sum_{n=1}^{\infty} C_n e^{-n\pi x/a} \sin(n\pi y/a)$$

$$C_n = \frac{2}{a} \int_0^a V_0(y) \sin(n\pi y/a)\, dy$$

$$\therefore C_n = \frac{2V_0}{a} \int_0^a \sin(n\pi y/a)\, dy$$

$$= \frac{2V_0}{a} \frac{(-a)}{n\pi} \cos(n\pi y/a) \Big|_0^a$$

$$= \frac{2V_0}{n\pi} \left[1 - \cos(n\pi) \right]$$

$$= \begin{cases} 0 & \text{for even } n \\ \frac{4V_0}{n\pi} & \text{for odd } n \end{cases}$$