

**Nuclear Engineering 150 – Discussion Section**  
**Team Exercises #10**

## **Problem 1**

Consider an infinite slab of material described by diffusion coefficient  $D$  and macroscopic cross section  $\Sigma_a$ . The material extends infinitely in two dimensions, but has vacuum boundaries at  $x = a$  and  $x = 0$ . At  $x = 0$  there is also a uniformly distributed source plane with strength  $s''$  [neutrons per area]. Find the flux in this geometry. (You may use the substitution  $L = \sqrt{\frac{D}{\Sigma_a}}$ .)

## Problem 2

Consider an infinite slab of material described by diffusion coefficient  $D$  and macroscopic cross section  $\Sigma_a$ . The material extends infinitely in two dimensions, but has vacuum boundaries at  $x = \pm a$ . Inside the slab is a uniformly distributed source with strength  $s'''$  [neutrons per volume]. Find the flux in this geometry. (You may use the substitution  $L = \sqrt{\frac{D}{\Sigma_a}}$ .)