Math 12 – Fall 2010
Written Homework 6
Due Friday, November 5, 2010.

From Stewart:

Chapter 16 *Problems Plus*: 2.

Also:
Let C be the region in $\mathbb{R}^2$ bounded by a convex polygon ("convex" means that all the interior angles are less than π) with area A and perimeter P. Define the function $d : \mathbb{R}^2 \to \mathbb{R}$ by $d(x, y)$ as the distance from the point (x, y) to the region C. Show that there are positive constants a, b, and c such that

$$\iint_{\mathbb{R}^2} e^{-d(x,y)}\, dx\, dy = aA + bP + c$$

regardless of what the convex polygonal region C is, and determine the constants a, b, and c.