

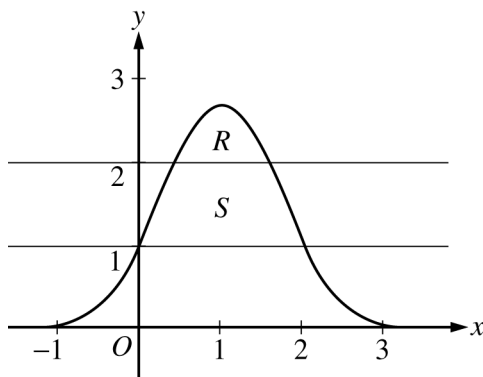
**2007 AP<sup>®</sup> CALCULUS AB FREE-RESPONSE QUESTIONS (Form B)**

**CALCULUS AB  
SECTION II, Part A**

**Time—45 minutes**

**Number of problems—3**

**A graphing calculator is required for some problems or parts of problems.**



1. Let  $R$  be the region bounded by the graph of  $y = e^{2x-x^2}$  and the horizontal line  $y = 2$ , and let  $S$  be the region bounded by the graph of  $y = e^{2x-x^2}$  and the horizontal lines  $y = 1$  and  $y = 2$ , as shown above.
- (a) Find the area of  $R$ .
- (b) Find the area of  $S$ .
- (c) Write, but do not evaluate, an integral expression that gives the volume of the solid generated when  $R$  is rotated about the horizontal line  $y = 1$ .

**WRITE ALL WORK IN THE EXAM BOOKLET.**