

Name _____

- You have 15 minutes
- No calculators
- Show sufficient work

1. Let \mathbf{R} be the finite region bounded by the graphs of $y = 5 + 3e^x$, $y = 8$ and $x = 2$. Set up, but do not evaluate, definite integrals which represent the volumes of the following solids.

(a) The volume of the solid formed when \mathbf{R} is revolved around the vertical line $x = 4$. Determine this volume in the following two ways.

i. (2 points) Integrate with respect to x .

ii. (2 points) Integrate with respect to y . (Use different integrands in parts *i* and *ii*.)

- (b) (3 points) The volume of the solid with base \mathbf{R} for which the cross-sections perpendicular to the x -axis are semi-circles.

2. (3 points) Find the average value of the function $f(x) = \frac{e^{\sqrt{x}}}{\sqrt{x}}$ on the interval $[25, 81]$.