

8 Calculus ch. 8 volume—disk or washer method

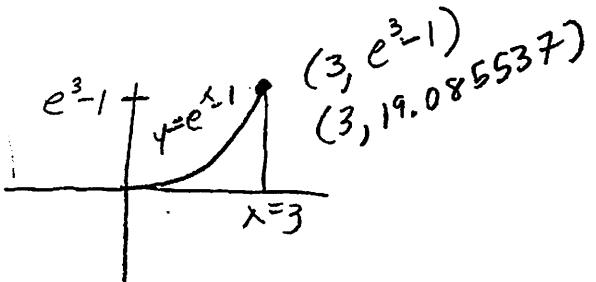
You may use a calculator, but you must set up the integral the correct way.- sketch
 The region bounded by
 $y=e^x-1$, $x=3$ and the x -axis and y-axis

Find the volume when the region is revolved about

1) The x axis

$$\pi \int_0^3 (e^x - 1)^2 dx$$

$$166.043\pi$$



2) The y-axis

$$\begin{aligned} y &= e^x - 1 \\ y+1 &= e^x \\ \ln(y+1) &= x \end{aligned}$$

$$\pi \int_0^{19.085537} 3^2 - (\ln y + 1)^2 dy = 73.321\pi$$

3) The line $x=3$

$$\pi \int_0^{19.085537} (3 - \ln(y+1))^2 dy = 23.17\pi$$

4) The line $y=25$

$$\pi \int_0^3 (25)^2 - (25 - (e^x - 1))^2 dx$$

$$638.243\pi$$