

No notes or calculators. You can leave an answer as a numerical expression without computing the final value. For example, this is a perfectly acceptable answer :

$((250 - 63)/(1 - e^{(-6*3.5)})) * \ln(27/168)$ . Show your work clearly !!

1. (4 points) Compute the integral.

$$\int \frac{1}{\sqrt{x}} e^{(\sqrt{x}+1)} dx.$$

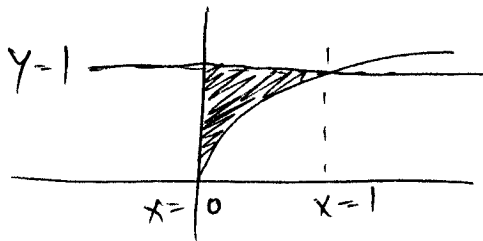
$$1. u = \sqrt{x} + 1$$

$$2. \frac{du}{dx} = \frac{1}{2\sqrt{x}} \Rightarrow 2du = \frac{1}{\sqrt{x}} dx$$

$$3. \int e^u (2du) = 2e^u$$

$$= \boxed{2e^{(\sqrt{x}+1)} + C}$$

2. (6 points) Find the volume of the solid of revolution formed by rotating the area enclosed by the curves  $y = \sqrt{x}$  and  $y = 1$  between  $x = 0$  and  $x = 1$ .



$$\text{Volume} = \pi \int_0^1 (1^2 - (\sqrt{x})^2) dx = \pi \int_0^1 (1 - x) dx$$

$$= \pi \left( x - \frac{x^2}{2} \right) \Big|_0^1$$

$$= \pi \left( 1 - \frac{1}{2} \right) = \boxed{\frac{\pi}{2}}$$