

$$1 \mid \int_1^2 \frac{e^{\frac{1}{x}}}{x^2} dx$$

$$\begin{aligned} \int -e^u du &= -e^u + C \\ &= -e^{\frac{1}{2}} + e^{\frac{1}{1}} \\ &= e - e^{\frac{1}{2}} \end{aligned}$$

$$2 \mid \int_0^1 r e^{\frac{r}{2}} dr$$

$$\begin{aligned} \int_0^1 r e^{\frac{r}{2}} dx &\implies r 2 e^{\frac{r}{2}} \int 2 e^{\frac{r}{2}} dr \\ &= 2 r e^{\frac{r}{2}} \int 2 e^{\frac{r}{2}} dr \\ &= 2 r e^{\frac{r}{2}} 4 e^{\frac{r}{2}} \\ &= 4 r e^r \end{aligned}$$