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

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

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

$$\int_0^1 re^{\frac{r}{2}} dx \implies r\frac{2}{r}e^{\frac{r}{2}} \int \frac{2}{r}e^{\frac{r}{2}} dx$$
$$= 2e^{\frac{r}{2}} \int \frac{2}{r}e^{\frac{r}{2}} dx$$
$$= 2e^{\frac{r}{2}} \int \frac{2}{r}e^{\frac{r}{2}} dx$$