2. $Y = e^X$

$X \sim N(\mu, \sigma^2)$

1. CDF of Y:

$$P(Y \le y) = P(X \le \ln(y))$$

$$= P\left(\frac{X-\mu}{\sigma} \le \frac{\ln(y)-\mu}{\sigma}\right)$$

$$= \begin{cases} \Phi\left(\frac{\ln(y)-\mu}{\sigma}\right) & y \ge 0 \\ 0 & y \le 0 \end{cases}$$

2. Taking derivative and using chain rule:

PDF:

$$f(y) = \frac{1}{y\sigma\sqrt{2\pi}} e^{-\frac{(\ln(y)-\mu)^2}{2\sigma^2}}$$

Similarly get the same answer using Method of Transformations