

$$\begin{aligned}\int_{-\infty}^6 re^{r/3} dr &= \lim_{t \rightarrow -\infty} \int_t^6 re^{r/3} dr = \lim_{t \rightarrow -\infty} [3re^{r/3} - 9e^{r/3}]_t^6 \quad \left[ \begin{array}{l} \text{by integration by} \\ \text{parts with } u = r \end{array} \right] \\ &= \lim_{t \rightarrow -\infty} (18e^2 - 9e^2 - 3te^{t/3} + 9e^{t/3}) = 9e^2 - 0 + 0 \quad [\text{by l'Hospital's Rule}] \\ &= 9e^2 \quad \text{Convergent}\end{aligned}$$