① Find $\nabla \log r$. Ans. $\dfrac{\vec{r}}{r^2}$

② Find $\nabla\left(\dfrac{e^{4r}}{r}\right)$ Ans. $\dfrac{e^{4r}}{r^3}(4r-1)\vec{r}$

③ Find the directional derivative of $f = 4e^{x+5y-13z}$ at $(1,2,3)$ in the direction towards the point $(-3,5,7)$.

Ans. $-4\sqrt{41}\, e^{-28}$.