$$\nabla' T(\vec{\mathscr{r}}) \qquad \vec{\mathscr{r}} = \vec{r} - \vec{r}\,'$$

$$= \nabla_{\vec{r}\,'} T(\vec{\mathscr{r}})$$

$$= \hat{x} \frac{\partial}{\partial x'} T(x-x', y-y', z-z') + \hat{y} \frac{\partial}{\partial y'} T \cdots\cdots$$

$$= \hat{x} \frac{\partial}{\partial (x-x')} T(x-x', y-y', z-z') \overbrace{\boxed{\frac{\partial (x-x')}{\partial x'}}}^{-1} + \cdots\cdots$$

$$= -\hat{x} \frac{\partial}{\partial x} T(x-x', y-y', z-z') \overbrace{\boxed{\frac{\partial x}{\partial (x-x')}}}^{1} + \cdots\cdots$$

$$= -\nabla_{\vec{r}} T(\vec{\mathscr{r}}) = -\nabla T(\vec{\mathscr{r}}) = -\nabla_{\vec{\mathscr{r}}} T(\vec{\mathscr{r}})$$

$$\nabla'\left(\frac{1}{\mathscr{r}}\right) = \frac{\hat{\mathscr{r}}}{\mathscr{r}^2} \quad \text{because} \quad \nabla\left(\frac{1}{\mathscr{r}}\right) = -\frac{\hat{\mathscr{r}}}{\mathscr{r}^2} = \nabla_{\vec{\mathscr{r}}}\left(\frac{1}{\mathscr{r}}\right)$$