$$T = \frac{k}{\sqrt{x^2+y^2+z^2}} \text{ and } 120 = T(4,4,2) = \frac{k}{6} \text{ so } k = 720.$$

(a) $\mathbf{u} = \dfrac{\langle 3,1,1\rangle}{\sqrt{11}}$,

$$\begin{aligned} D_{\mathbf{u}}T(4,4,2) &= \nabla T(4,4,2)\cdot\mathbf{u} \\ &= \Big[-720(x^2+y^2+z^2)^{-3/2}\langle x,y,z\rangle\Big]_{(4,4,2)}\cdot\mathbf{u} \\ &= -\tfrac{10}{3}\langle 4,4,2\rangle\cdot\tfrac{1}{\sqrt{11}}\langle 3,1,1\rangle \\ &= -\tfrac{60}{\sqrt{11}} \end{aligned}$$

(b) From (a), $\nabla T = -720(x^2+y^2+z^2)^{-3/2}\langle x,y,z\rangle$, and since $\langle x,y,z\rangle$ is the position vector of the point (x,y,z), the vector $-\langle x,y,z\rangle$, and thus ∇T, always points toward the origin.