We know upper and lower bounds for the quantities $P'_{i_0}(t)$ and $P'_{j_0}(t)$ from the calculation done for the asymptotics of degree of fixed vertex.

$$\frac{1}{2^d(2t+1)} \leq P'_{i_0}(t), P'_{j_0}(t) \leq \frac{1}{t+2-d}.$$

Substituting these values immediately yield

$$\mathbb{1}_{\{k=1\}} + \frac{(k-1)p_{k-1}}{2^{d+1}} - kp_k \leq p_k \leq \mathbb{1}_{\{k=1\}} + (k-1)p_{k-1} - \frac{kp_k}{2^{d+1}},$$

by having t approach ∞ and taking limits on all sides.