1. Frame $S^{\prime}$ moves at $v$ relative to the inertial frame $S$ along the $x$-direction, as shown in the figure below. The wave equation for a traveling wave observed in $S^{\prime}$ is given by

$$
\frac{\partial^{2} \psi}{\partial x^{\prime 2}}-\frac{1}{u^{\prime 2}} \frac{\partial^{2} \psi}{\partial t^{\prime 2}}=0
$$

where $u^{\prime}$ is the velocity of the propagating wave. What is the wave equation in frame $S$ under Galilean transformation?


