

LT inv

$$\begin{array}{l|l}
 x' = \gamma(x - vt) & x = \gamma(x' + vt') \\
 t' = \gamma\left(t - \frac{vx}{c^2}\right) & t = \gamma\left(t' + \frac{vx'}{c^2}\right)
 \end{array}$$

$$\begin{array}{ll}
 \downarrow t' = \gamma t - \frac{\gamma v x}{c^2} & x' = \gamma x - \gamma vt \\
 -\gamma t = -t' - \frac{\gamma vx}{c^2} & \gamma x = x' + \gamma vt \\
 \gamma t = t' + \frac{\gamma vx}{c^2} & \gamma x = x' + \gamma v \left(\frac{t'}{\gamma} + \frac{vx'}{c^2} \right) \\
 t = \frac{t' + \frac{\gamma vx}{c^2}}{\gamma} & \gamma x = x' + vt' + \frac{\gamma v^2 x}{c^2} \\
 \boxed{t = \frac{t'}{\gamma} + \frac{vx}{c^2}} & x = \frac{x'}{\gamma} + \frac{vt'}{\gamma} + \frac{v^2 x}{c^2}
 \end{array}$$

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