$$x=tvcosA$$

$$y=tvsinA-\frac{gt^{2}}{2}$$

$$y=xTanA-\frac{gx^{2}}{2v^{2}}\left(1+\left(TanA\right)^{2}\right)$$

$$v^{2}=\frac{\left(1+\left(TanA\right)^{2}\right)gx^{2}}{2\left(y-xTanA\right)}$$

$$TanA=T$$

$$v^{2}=\frac{\left(1+T^{2}\right)gx^{2}}{2\left(y-xT\right)}$$

$$0=\frac{∂\left(v^{2}\right)}{∂T}=\frac{gx^{2}}{2}\left[\frac{\left(1+2T\right)\left(y-xT\right)+\left(1+T^{2}\right)x}{\left(y-xT\right)^{2}}\right]=0$$

$$xT^{2}+\left(x-2y\right)T-\left(x+y\right)=0$$

$$T\_{1,2}=\frac{2y-x\mp \sqrt{\left(x-2y\right)^{2}+4x\left(x+y\right)}}{2x}$$