't Hooft GR exercise 11.1 pg 51.

$$\begin{cases} \left(\frac{r}{2M}-1\right) e^{r/2M} = xy \\ e^{t/2M} = x/y \end{cases}$$

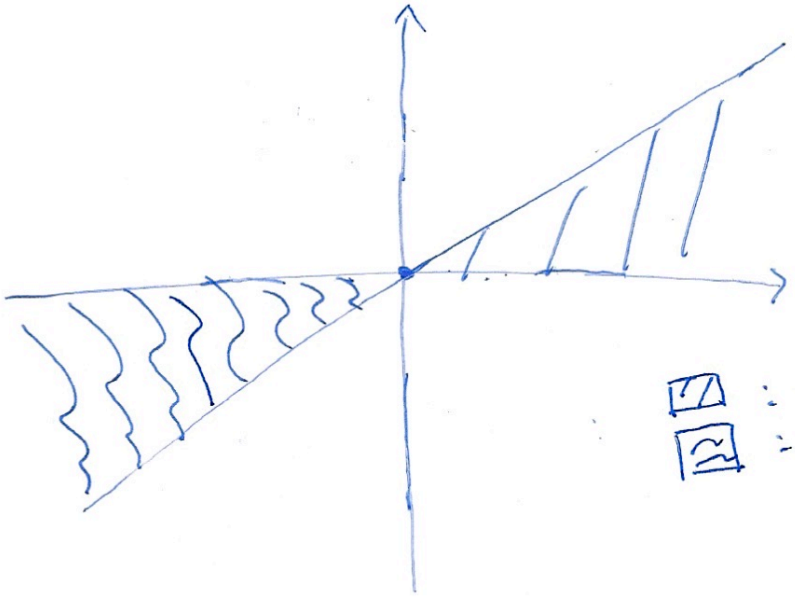
$$\Rightarrow \quad x^2 = \left(\frac{r}{2M}-1\right) e^{(r+t)/2M}$$

$$\begin{cases} x = \pm\sqrt{\frac{r}{2M}-1}\; e^{(r+t)/2M} \\ y = x\, e^{-t/2M} \end{cases}$$

For $r > 2M$, x, y are real, for $r < 2M$, x, y imaginary

The two distinct solutions of x are given by a sign flip, so the other solution is found by mirroring across x, y axis.

$r > 2M$:



: universe 1
: universe 2

Dandan
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