

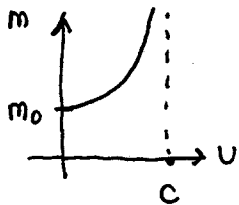
Show all work on this sheet, including mental steps, in a clearly organized way that speaks for itself. Use proper mathematical syntax/notation. Box short final answers.

① Solve for  $x$ :  $e^{3x-4} = 2.$

② The relativistic mass  $m > 0$  of a particle with speed  $v \geq 0$  is:

$$m = f(v) = \frac{m_0}{\sqrt{1 - \frac{v^2}{c^2}}}, \quad \text{where } m_0 > 0 \text{ is the rest mass of the particle}$$

and  $c > 0$  is the speed of light in vacuum (ie,  $m_0$  and  $c$  are just positive constants).



Find the inverse function  $f^{-1}$  (ie  $v = f^{-1}(m)$ ) and its domain.