Analysis 2 - HW 2

Note Title 1/28/2013

(1) In class we worked out that if mass m = const: $v(t) = \frac{f}{m} t$ (1) where f is a constant force. On the other hand, if mass m is not constant we postulated, in accordance with Special Relativity, that $m = \frac{m_0}{\sqrt{1 - \frac{v(t)^2}{c^2}}}$. Solving the resulting DE we determined that

$$v(t) = \frac{c \cdot f \cdot t}{\sqrt{(f \cdot t)^2 + c^2 m_0^2}} \quad (2)$$

Show that (2) reduces to (1) by finding the Taylor polynomial for (2) centered at $t = 0$. Note that this means that relativistic formulas for $v(t)$ are approx. equ to classical Newton'an formulas. Experience (and Physics) indeed confirms that.