$$f(r) := \frac{(m-\frac{4}{3}\pi\rho r^3)gt}{6\pi rs(1+2,1\frac{r}{R})} = \frac{mgt}{\underbrace{6\pi s}_{A}} \cdot \frac{1}{r + \underbrace{\frac{2,1}{R}}_{B} \cdot r^2} - \frac{2\rho gt}{\underbrace{9s}_{C}} \cdot \frac{r^2}{(1+\frac{2,1}{R}r)} = A \cdot \underbrace{\frac{1}{r+Br^2}}_{f_1(r)} - C\underbrace{\frac{r^2}{1+Br}}_{f_2(r)} = Af_1(r) - Cf_2(r)$$

Na dann, ans Werk:

$$f'(r) = A \cdot f_1'(r) - C \cdot f_2'(r)$$

Wobei:

$$f_1'(r) = -\frac{1+2Br}{(r+Br^2)^2}; \quad f_2'(r) = \frac{(1+Br)2r - Br^2}{(1+Br)^2} = \frac{r(2+Br)}{(1+Br)^2}$$

Also ausgeschrieben:

$$f'(r) = -\frac{mgt(1+\frac{4,2r}{R})}{6\pi sr^2(1+\frac{2,1}{R}r)^2} - \frac{2\rho gt}{9s} \cdot \frac{r(2+\frac{2,1}{R}r)}{(1+\frac{2,1}{R}r)^2}$$