

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

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:

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