\[ F = \left( m_c + m_F \right) \frac{A_0}{1 + \alpha} \left\{ \left[ \frac{2}{r-1} \left( \frac{T_0 - T_c}{T_0 - T_c} - 1 \right) \right]^{\frac{1}{2}} - M_0 + \alpha \left( \left[ \frac{2}{r-1} \left( \frac{T_0 - T_c}{T_0 - T_c} - 1 \right) \right]^{\frac{1}{2}} - M_0 \right) \right\} \]

all known

can also calculate (if needed)

\[ f = \frac{m_c}{m_c + m_F} \quad \text{input} \]

\[ m_F = \text{calculated already} \]

and

\[ s = \frac{f}{(1 + \alpha) \left( \frac{E}{m_c + m_F} \right)} \]

all calculated from above.