

$$\frac{m_1^2 + m_2^2 + m_3^2 - 2m_1^2 m_2^2 - 2m_1^2 m_3^2 - 2m_2^2 m_3^2}{-m_1^3 + m_1^3 m_2 + m_1^3 m_3} \quad \left| \begin{array}{l} m_1 - m_2 - m_3 \\ m_1^3 + m_1^2 m_2 + m_1^2 m_3 - m_1 m_2^2 \end{array} \right.$$

$$m_1^3 m_2 + m_1^3 m_3 - 2m_1^2 m_2^2 - 2m_1^2 m_3^2 + m_1^2 m_2^2 + m_1^2 m_3^2 - 2m_2^2 m_3^2$$

$$-m_1^3 m_2 + m_1^3 m_3 + m_1^2 m_2^2 m_3$$

$$m_1^3 m_2 - m_1^2 m_2^2 - 2m_1^2 m_2^2 + m_1^2 m_2 + m_2^2 + m_3^2 - 2m_2^2 m_3^2$$

$$-m_1^3 m_2 + m_1^2 m_3^2 + m_1^2 m_2 m_3$$

$$-m_1^2 m_2^2 - m_1^2 m_3^2 + 2m_1^2 m_2 m_3 + m_1^2 + m_2^2 + m_3^2 - 2m_2^2 m_3^2$$

$$2m_1^2 m_2^2 - 2m_1^2 m_3^2$$

$$M = \sqrt{m_1^2 + p^2} + \sqrt{m_2^2 + p^2}$$

$$M^2 = m_1^2 + p^2 + m_2^2 + p^2 + 2\sqrt{(m_1^2 + p^2)(m_2^2 + p^2)}$$

$$M^2 - m_1^2 - m_2^2 - 2p^2 = 2(m_1^2 + p^2)(m_2^2 + p^2)$$

$$M^4 + m_1^4 + m_2^4 + \cancel{4p^4} - 2M^2 m_1^2 - 2M^2 m_2^2 - \cancel{4M^2 p^2} + 2m_1^2 m_2^2$$

$$+ \cancel{4m_1^2 p^2} + \cancel{4m_2^2 p^2} = 4m_1^2 m_2^2 + \cancel{4m_1^2 p^2} + \cancel{4m_2^2 p^2} + \cancel{4p^4}$$

$$4M^2 p^2 = M^4 + m_1^4 + m_2^4 - 2m_1^2 m_2^2 - 2M^2 m_1^2 - 2M^2 m_2^2 + 2m_1^2 m_2^2$$

$$p^2 = \frac{c^4}{4m^2} \left(\right)$$

$$M^2 (M^2 - (m_1^2 - m_2^2)) (M^2 - (m_1 + m_2)^2)$$

$$(M^2 - m_1^2 - m_2^2 + 2m_1 m_2) (M^2 - m_1^2 - m_2^2 - 2m_1 m_2)$$