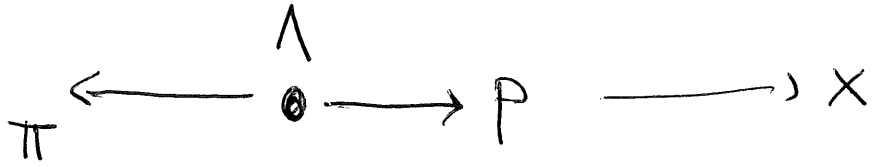
7.8

$c=1$



$$P_\Lambda^\mu = (m_\Lambda, 0, 0, 0)$$
$$P_\pi^\mu = (E_\pi, P_\pi, 0, 0)$$
$$P_p^\mu = (E_p, P_p, 0, 0)$$

Choose the x axis. Drop the other two

$$P_\Lambda^\mu = P_\pi^\mu + P_p^\mu \Rightarrow \begin{cases} m_\Lambda = E_\pi + E_p \\ 0 = P_\pi + P_p \end{cases}$$

$\Rightarrow$ Set $P_p = -P_\pi = P$

$$m_\Lambda = \sqrt{m_\pi^2 + P^2} + \sqrt{m_p^2 + P^2}$$

Solve for P: (move one $\sqrt{}$ to the left & square. Then square again)

$$P = \frac{\sqrt{m_\Lambda^4 + m_\pi^4 + m_p^4 - 2m_\Lambda^2 m_\pi^2 - 2m_\Lambda^2 m_p^2 - 2m_\pi^2 m_p^2}}{2m_\Lambda}$$

$= 117\ \text{MeV}$

↑ same as in the Compendium