$q_1^2 = m_1^2$
$-k_1 + p_1 + p_2$
$k_2 - p_1 - p_2$
$p_1^2 = 0$
m_2
$k_1 + q_2$
$-k_1 + k_2$
$k_2 - p_2$
$q_2^2 = 0$
$-k_1$
k_2
$p_2^2 = 0$