The elementary liquid-phase reaction: $A \rightarrow B$, is carried out adiabatically in a CSTR with a volume of 2 m^3. The specific reaction rate, k, is 3 h^{-1} at 350 K. The feed enters at 52 ^{o}C, and is composed of pure A, with F_{Ao} = 10 mol/min, and C_{A0} = 3 mol/m^3. Heat capacity data: A = 530, B = 120 J/mol.K. Heat of reaction = -55 kJ/mol. Activation energy = 52 kJ/mol.K.

Solve for X and T, when $X_{EB} = X_{MB}$, using Polymath. Show your derivations.