1. $u^3 - 7u - 6$ has a factor $(u - (-2))$ compute all other factors:

$(u - 3)\ (u - 1)\ (u + 2)$

$(u - 1)\ (u + 2)^2$

$(u - 3)\ (u + 1)\ (u + 2)$

$(u - 3)\ (u + 2)^2$

Solution
Apply Long Division.
$(u - 3)\ (u + 1)\ (u + 2)$