5. $u^3 + 3u^2 - 4u - 12$ has a factor $(u-(-3))$ compute all other factors:

$(u + 1)(u + 2)(u + 4)$

$(u - 2)(u + 2)(u + 4)$

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

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

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