2. $w^3 + 2w^2 - w - 2$ has a factor $(w - (-2))$ compute all other factors:

$(w - 1)(w + 2)(w + 3)$

$(w - 1)(w + 4)^2$

$(w - 1)(w + 1)(w + 2)$

$(w - 2)(w - 1)w$

Solution
Apply Long Division.
$(w - 1)(w + 1)(w + 2)$