3. $a^3 + 8a^2 + 19a + 12$ has a factor $(a-(-4))$ compute all other factors:

$(a + 2)(a + 4)^2$

$(a - 3)(a + 3)(a + 4)$

$(a + 1)(a + 3)(a + 4)$

$(a - 2)\,a\,(a + 4)$

Solution
Apply Long Division.
$(a + 1)(a + 3)(a + 4)$