2. $g^3 - g^2 - 12g$ has a factor $(g-(-3))$ compute all other factors:

$(g - 2)\, g\, (g + 2)$

$(g - 2)^2\, (g + 3)$

$(g - 4)\, g\, (g + 3)$

$(g - 2)\, (g + 3)\, (g + 4)$

Solution
Apply Long Division.
$(g - 4)\, g\, (g + 3)$