$f(x) = x^3 + 3x^2 + 2x + 6$

Factor out an x^2 Factor out a 2

1. Find a GCF of two or more subsets of the whole function

$f(x) = x^2(x + 3) + 2(x + 3)$

2. Recognize that there is now another common factor, in this case the binomial $(x + 3)$

$f(x) = (x + 3)(x^2 + 2)$

3. Pull that GCF out. In this case, it multiplies x^2 and 3 in the binomial $(x^2 + 2)$

$(x + 3)(x^2 + 2) = 0$

4. Now the roots are easily found. One is $x = -3$, and the other two are the solutions to $x^2 = -2$ (two complex conjugates).