

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

$\underbrace{\hspace{2cm}} \quad \underbrace{\hspace{2cm}}$   
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).