- **Conclusions**:

  So, we find that if $x^3 - 2x^2 + x + 4 = 0$ then $x = -1$, $x = 1 + \dfrac{\sqrt{7}}{3}i$, or $x = 1 - \dfrac{\sqrt{7}}{3}i$.

12.3 Problems (6 pt Problems)

1. Rewrite $x^3 - 3x - 2 = 0$ so that the polynomial on the left is in factored form. Use this form to solve the equation.

2. Solve $(x - 2)(x^2 - 3x + 1) = 0$.

3. Solve $x(2x^2 + 5) = 5x^2 + 2$.

12.4 Exercises

1. Rewrite $x^3 + 5x^2 + 8x + 4 = 0$ so that the polynomial on the left is in factored form. Use this form to solve the equation.

2. Solve $(3x + 2)(2x^2 - x + 2) = 0$.

3. Solve $x^3 - 5x^2 + 8x - 4 = 0$ using the fact that 1 is a zero of $x^3 - 5x^2 + 8x - 4$.

4. Solve $x^3 - 2x^2 - 5x - 2 = 0$ (hint: -1 is one solution).