1. **System of Linear Equations**
   Three points uniquely determine a degree 2 polynomial. Given the three points $\{(x_1, y_1) = (-1, 2), (x_2, y_2) = (1, -2), (x_3, y_3) = (2, 5)\}$ we wish to find the unique polynomial $p(x) = a_2 x^2 + a_1 x + a_0$ such that $p(x_i) = y_i$. In this question we will find $p(x)$ by solving a system of linear equations:

   (a) Write out an equation in terms of a_0, a_1, a_2 for $p(-1)$, or the polynomial $p(x)$ evaluated at $x = -1$.

   (b) Write out an equation in terms of a_0, a_1, a_2 for $p(1)$, or the polynomial $p(x)$ evaluated at $x = 1$.

   (c) Write out an equation in terms of a_0, a_1, a_2 for $p(2)$, or the polynomial $p(x)$ evaluated at $x = 2$.

   (d) Solve the system of linear equations from parts (a)-(c) to determine the values of a_0, a_1, a_2.