## Name:

**1.** Let  $x = (x_1, x_2, x_3)$ . The vector y is determined from x according to

$$y_1 = x_1 - x_2$$
  
 $y_2 = x_2 - x_3$   
 $y_3 = x_3 - x_1$ 

Determine a matrix A (where all entries of A are numbers) such that y = Ax.

**2.** Suppose the 4-vector *c* gives the coefficients of a cubic polynomial  $p(t) = c_1 + c_2 t + c_3 t^2 + c_4 t^3$ . Express the conditions

$$p(0) + p'(0) = 0$$
  
 $p(1) + p'(1) = 0$ 

as a set of linear equations of the form Ac = b. Give the sizes of A and b, as well as their entries.