(5.) (12 points) Suppose p is a cubic polynomial function. Recall that this means that

$$p(x) = a_3x^3 + a_2x^2 + a_1x + a_0,$$

for some constants a_0, a_1, a_2, a_3, with $a_0 \neq 0$.

(a) If $p(0) = 1$, what is the value of a_0?

(b) If $p'(0) = 1$, what is the value of a_1?

(c) If $p''(0) = 1$, what is the value of a_2?

(d) If $p'''(0) = 1$, what is the value of a_3?

(e) Find the formula for a cubic polynomial function q that satisfies:

$$q(0) = 2, \quad q'(0) = -1, \quad q''(0) = 5, \quad q'''(0) = 4.$$

[Note: You may use the information that you found in parts (a)-(d) to help you.]