1. (4 points) Doug’s Riders is a new company which makes bicycles. The cost (in dollars) of manufacturing $q$ bicycles is given by $C(q) = 90q + 1560$. The company charges its customers $\$210$ per bicycle.

(a) After the company pays for the fixed costs, what does it cost them to produce each new bicycle?

(b) Give a formula for the revenue function, $R(q)$, for this company.

(c) Does the company suffer a loss or earn a profit if they only manufacture and sell 10 bicycles? Explain your answer and give the dollar amount for this loss or profit.

(d) Find the break-even point, $q_0$, and illustrate it graphically. Be sure to include the coordinates for this point as well as the coordinates for all intercepts.
2. (6 points) The population of Nicaragua is currently 4.6 million and growing at a rate of 3% per year. Let \( P(t) \) be Nicaragua’s population (in millions) \( t \) years from now. Assume that its population continues to grow at its current rate.

(a) Find \( P(1) \).

(b) Find a formula for \( P(t) \).

(c) Estimate what Nicaragua’s population will be in the year 2031.

(d) Estimate when Nicaragua’s population will reach 10 million. Your answer should be given to the nearest whole year.