Compute the Value of m in the Period-Two Cycle

Determine the value of m_1 as follows:

(a) Show that the period-two fixed-point equations, given by

$$x_1 = \mu x_0(1 - x_0), \qquad x_0 = \mu x_1(1 - x_1),$$

with $x_0 = 1/2$ reduces to

$$\mu^3 - 4\mu^2 + 8 = 0.$$

(b) Using long division, determine the quadratic polynomial obtained from

$$(\mu^3 - 4\mu^2 + 8)/(\mu - 2).$$

Show that the positive root of this quadratic is

$$m_1 = 1 + \sqrt{5}.$$