Chaos and Fractals: HW 2

This 15 point HW problem is due by next Monday, October 2. It is essentially problem 8 from section 2.13 of our text I expect it to be typed and you can email the PDF to me. I recommend that you type it using LaTeX.

The problem

We wish to find a number $x_0 \in I = [0, 1]$ that lands on a point of period 7 after exactly 11 steps under iteration of $g(x) = 4x(1 - x)$.

1. (10 pts) Outline a strategy for finding x_0. Express it *exactly* in a form that uses a sum and, possibly, a conjugating function.

2. (5 pts) Find a decimal approximation to x_0.

Note: I would expect your answer to part (a) to look something like $\cos(17\pi/64)$.