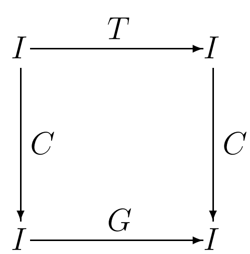
Question
Consider the tent map $t: I \longrightarrow I$ and its itineraries. Find that end-points of the subinterval of I consisting of all those points whose itinerary begins LRR, and likewise for LRRLRR. Find a point x_n whose itinerary begins LRRLRR $\cdots$ LRR (n times). Hence find a point of period 3 for T, and verify directly from T that its period is 3. Give a point of period 3 for the logistic map $G(x) = 4x(1-x)$.

Answer
For the tent map T the interval LRR is $\left[\frac{1}{4}, \frac{3}{8}\right]$ i.e. the third of 8 subintervals.
Hence the interval LRRLRR is the third of 8 subintervals, i.e. $\left[\frac{18}{64}, \frac{19}{64}\right]$.
Continuing we see that the point with itinerary LRRLRRLRR $\cdots$ is:

$$\frac{2}{8} + \frac{2}{8^2} + \frac{2}{8^3} + \cdots = 2\frac{\frac{1}{8}}{1-\frac{1}{8}} = 2 \ \cdot \frac{1}{7} = \frac{2}{7}$$

$\left(= 1 - \left[\frac{5}{8} + \frac{5}{64} + \cdots\right] = 1 - 5 \cdot \frac{1}{7} = 1 - \frac{5}{7} = \frac{2}{7}. \surd \right)$
<u>Check</u>: $T\left(\frac{2}{7}\right) = \frac{4}{7}$; $T\left(\frac{4}{7}\right) = 2\left(\frac{3}{7}\right) = \frac{6}{7}$; $T\left(\frac{6}{7}\right) = 2\left(\frac{1}{7}\right) = \frac{2}{7}$.
Since we have a conjugacy



with $C(x) = \frac{1}{2}(1 - \cos \pi x)$ a point of period 3 for G is $C\left(\frac{2}{7}\right) = \frac{1}{2}\left(1 - \cos\frac{2\pi}{7}\right)$