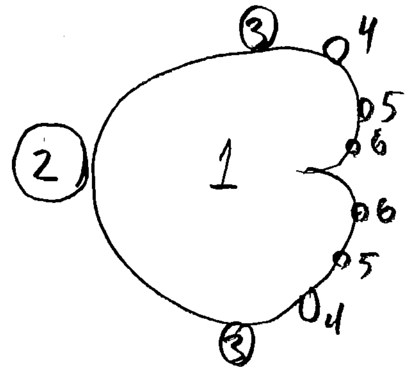
Dec 8 Review 1

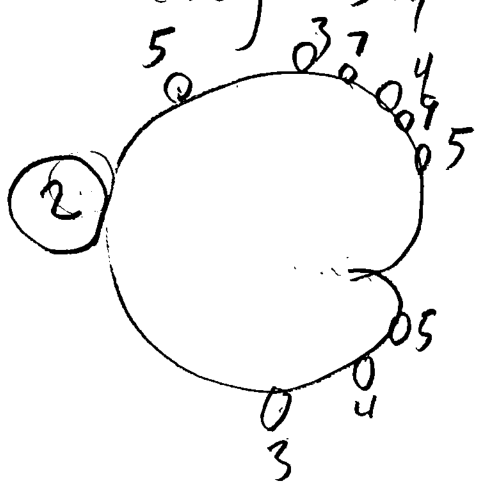
① Principal series

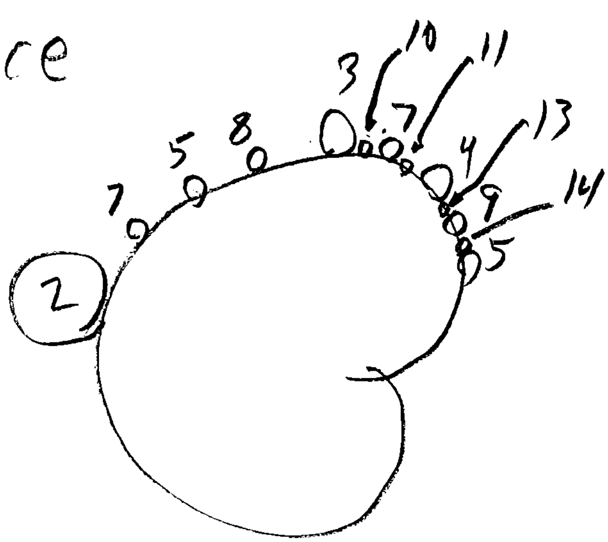


into the cusp of the cardioid we find cycles arbitrarily large

every c in the cardioid gives an iteration $z_{n+1} = z_n^2 + c$, $z_0 = 0$, that converges to a fixed point.

② Farey sequence

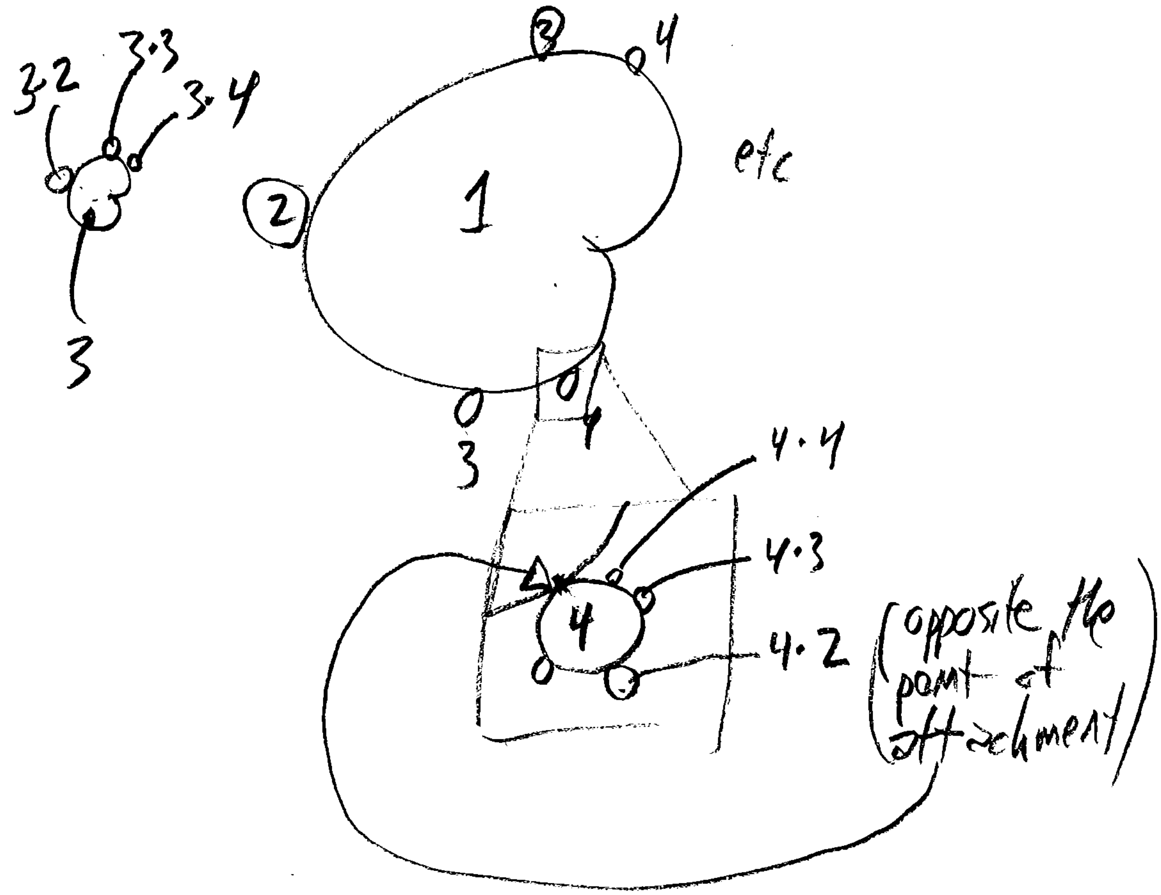




etc

Between consecutive discs, the largest disc (smallest cycle number) has number the sum of the two around it.

3 Multiplier rule



4 Lavaur's algorithm

2-cycle: $1/3,\ 2/3$ $\quad D(1/3) = 2\cdot 1/3 = 2/3$

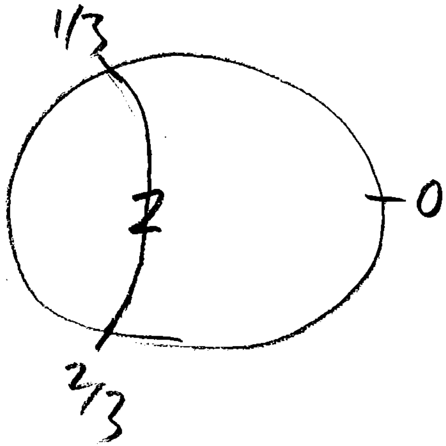
$1/3 = 1/2^2-1$ $\quad D(2/3) = 2\cdot 2/3 - 1 = \frac{4}{3} - 1 = 1/3$

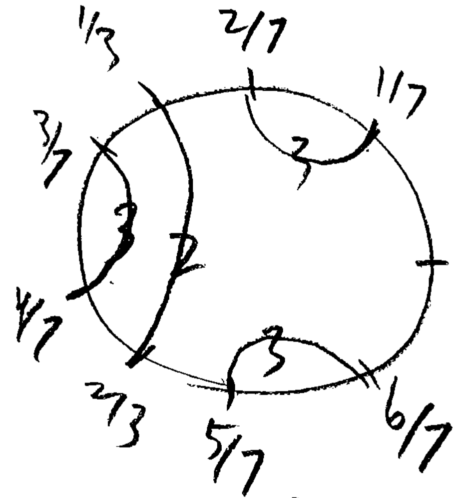
3-cycles: $1/7,\ 2/7,\ \ldots,\ 6/7$ $\quad 1/7 = 1/2^3-1$

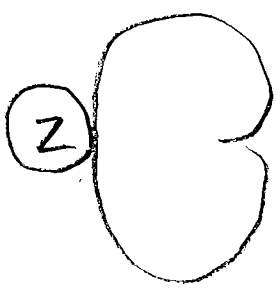
4-cycles: $1/15,\ 2/15,\ \ldots,\ 14/15$ $\quad 1/15 = 1/2^4-1$

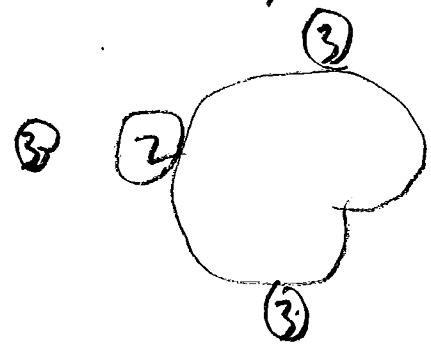
5-cycles: $1/31,\ 2/31,\ \ldots\ 30/31$ $\quad 1/31 = \frac{1}{2^5}-1$

We connected consecutive pairs of these numbers, not crossing a previously-drawn connection









5-cycles: $1/31$, $2/31$, $3/31$, ..., $30/31$

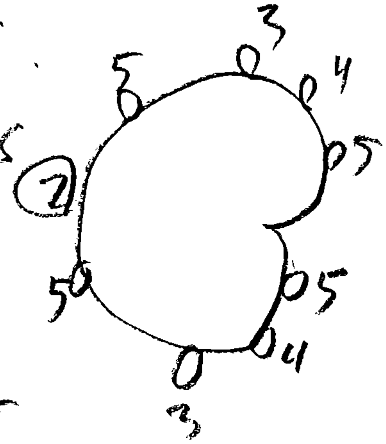
connecting in pairs gives 15 5-cycle discs or cardioids.

number of 5-cycle discs

2 principal series

2 Farey seq

0 attached to other discs or cardioids by the multiplier rule



number of 5-cycle cardioids is
15 - 4 = 11

6-cycle cardioids : 20

7-cycle cardioids : 57

8-cycle cardioids : 120