a) First integers: find 61 in binary:

What is a recipe which works for any number, eg 17513? (Don't) do it!)

6) Fractions What faction is 0.101 ?

Find + binary :

- d) Show how the algorithm for getting binary expansion is the same as applying 2x (mod 1) map.
- e) So precisely which x ∈ (0,1) give chaotre orbits?

MATH 53 WORKSHEET: Binary fractions

SOLUTIONS

Discourse find n=61 in binary:  $a_0 = 32 = n$ a) First integers: find n=61 in binary:  $a_0 = 64 = n$ 

remainder 61-32 = 29 = 16 + remainder = 13 = 8 + 2 + 1What is a recipe which works for any number, eg 17513? (Don't)

(ie algorithm)

6) Fractions: What faction is 0.101?

8x = 101.101 = 5+x

Show how the algorithm for getting binning expansion is the same as applying 2x (mod 1) map.

See above.

e) So precisely which  $x \in (0,1]$  give chaotre orbits? ones with nonrepeating binary expansions, which must therefore be irrational.