Solution Sheet 9, July 26, 2012

Answers

1. There are 49 ways, and even more methods of arriving at this answer. Perhaps the easiest is to use cases starting with using $0; 1$ or 2 50 coins.

2. (a) 11002222

   (b) $220200_3 = 2 \quad 3^5 + 2 \quad 3^4 + 0 \quad 3^3 + 2 \quad 3^2 + 0 \quad 3^1 + 0 \quad 3^0 = 666$

3. sub in $x = 0$ to nd a_0; $x = 1$ to nd $a_0 + a_1 + \quad a_{18}$; a_1 and a_{16} can be found using

$$\overline{4y}$$

$$(1 \quad y)(1 \quad x) < (1 \quad y)(1 \quad \frac{1}{4y})$$

$$(1 \quad y)(1 \quad x) < \frac{(1 \quad y)(4y \quad 1)}{4y})$$

But $(1 \quad y)(4y \quad 1) < y$ for all values of y (veri cation left to the reader). So

$$(1 \quad y)(1 \quad x) < \frac{(1 \quad y)(4y \quad 1)}{4y}) < \frac{y}{4y} = \frac{1}{4}$$