

## Extra Problems for 2/17

1. Show that if  $m > 0$ ,  $m \in \mathbb{Z}$  then

$$\frac{m + \sqrt{m^2 + 4}}{2} = [m, m, m, m, \dots].$$

2. Show that if  $m > 0$  and  $m, a \in \mathbb{Z}$  then

$$[a, m, m, m, \dots] = \frac{2a - m + \sqrt{m^2 + 4}}{2}.$$

3. Prove that if  $\alpha$  is irrational with  $\alpha > 1$  then if  $\alpha$  has simple continued fraction  $[q_0, q_1, q_2, \dots]$  then  $\frac{1}{\alpha}$  has simple continued fraction  $[0, q_0, q_1, q_2, \dots]$ .