

**An exercise on the hypergeometric method : BIRS 2012**

**Exercise M1.** (a) Find an explicit irrationality measure for  $\theta = \sqrt[3]{3}$ , i.e. an inequality of the form

$$\left| \sqrt[3]{3} - \frac{p}{q} \right| > c \cdot q^{-\lambda}$$

with  $\lambda < 3$ . (Hint : consider  $z = -1/8$ ).

(b) Use this inequality to solve the Thue inequality

$$|x^3 - 3y^3| \leq 100.$$

(c) Try something similar with  $\theta = \sqrt[3]{5}$ .

(d) Do you think the method works for  $\theta = \sqrt[3]{14}$ ?