

18.784: SEMINAR IN NUMBER THEORY
PROBLEM SET 3
DUE BY 11:59PM FRIDAY OCT 8

1. Alexandra presented much of the proof of Theorem 3.2.14 [Gouvea, 3rd edition] in class. Complete the proof of the uniqueness statement (which is started in the book).

2. (a) Compute the 3-adic expansion of $2/7$ in \mathbf{Q}_3 .
(b) Compute the 7-adic expansion of $5/1029$ in \mathbf{Q}_7 .
(c) Describe an algorithm to compute the 5-adic expansion of a square root of -1 in \mathbf{Q}_5 . Write down the first 5 terms.