

PHILADELPHIA UNIVERSITY
DEPARTMENT OF BASIC SCIENCES

Exam 2

Computational Number Theory

19–12–2006

1. Is n a Carmichael number? You must use the theorem to justify each answer.
 - (a) $n = 7 \cdot 13 \cdot 31$
 - (b) $n = 2 \cdot 13 \cdot 17$
 - (c) $n = 13 \cdot 31$
 - (d) $n = 11 \cdot 13 \cdot 17 \cdot 31$
2. Evaluate the continued fraction $[3, 6, \overline{1, 4}]$. Write your answer in the form $\frac{P+\sqrt{n}}{Q}$.
3. Represent $\sqrt{7}$ using a periodic infinite continued fraction.
4. Use Pollard rho method to factor the number 6697.
5. Let $n = 3837523$. Suppose we find the following data using quadratic sieve. Factor n .

	9398^2	19095^2	1964^2	17078^2	8077^2	3397^2	14262^2
2	0	2	0	6	1	5	0
3	0	0	2	2	0	0	0
5	5	1	0	0	0	1	2
7	0	0	0	0	0	0	2
11	0	1	0	1	0	0	0
13	0	1	3	0	0	2	1
17	0	0	0	0	0	0	0
19	1	1	0	0	1	0	0