

Euclidean Algorithm and Recurrence Relation Homework
for Janet Vassilev's Math 327 course

1. Express the greatest common divisor of 1000 and 1244 as an integral sum of 1000 and 1244.
2. Express the greatest common divisor of 987 and 333 as an integral sum of 987 and 333.
3. Show that the least common multiple g of n and m satisfies the formula $g = \frac{nm}{d}$ where d is the greatest common divisor of n and m .
4. If a and b are relatively prime, show that every equation $ax + by = c$ has a solution $(x, y) \in \mathbb{Z}^2$.
5. Solve the recurrence relation $a_n = -a_{n-1} + 3$ for $n \geq 2$ if $a_1 = -2$.
6. Solve the recurrence relation $a_n = 2a_{n-1} + n$ for $n \geq 2$ if $a_1 = 6$.
7. Solve the recurrence relation $a_n + a_{n-2} = 0$ for $n \geq 3$ if $a_1 = 2$ and $a_2 = -1$.
8. Solve the recurrence relation $a_n = 5a_{n-1} - 6a_{n-2}$ for $n \geq 3$ if $a_1 = 0$ and $a_2 = 4$.
9. Solve the recurrence relation $a_n = 4a_{n-1} - 4a_{n-2} + 2^n$ for $n \geq 3$ if $a_1 = 2$ and $a_2 = -2$.