Problem Solving With Arithmetic Sequences

1. Ray decides to save money by placing it in a metal box buried in his backyard. He starts with $10, and adds a constant amount of money each week, so that the fifth week he places $20 in the box. In what week will Ray place $90 in the box?
2. Farmer John feeds his horses the same amount of oats each day, starting on the first of January. The amount of oats left in the storage bin after *n* days is given by  kilograms.
   1. What amount of oats was in the storage bin on January 1?
   2. If farmer John continues to feed his horses this same amount every day, what will be the date when he runs out of oats? (Assume that it is not a leap year.)
3. Samantha is reading a particularly good book, and decides to read seven additional pages each day. The book has 1,342 pages. If she begins by reading 12 pages on the first day, how long will it take Samantha to finish the book?
4. A population of rats infests grain storage warehouse, and eats 2 bags of wheat the first week. As the rat population grows, they consume more bags of wheat each week. In the 17th week, the rats eat 14 bags of wheat.
   1. Assuming that the rats’ wheat consumption increases at a constant rate, find the general term formula for an arithmetic sequence that models this situation.
   2. If this pattern continues, in what week will the rats first eat more than 25 bags of wheat?
5. Lily joins a social networking Website, and after several weeks she analyzes the number of friends she has. Lily notices that her number of friends is increasing at a constant rate, and that she had 54 friends after 4 weeks, and 106 friends after 8 weeks. Assuming this pattern continues, how many weeks will it take for Lily to have more than 250 friends?