1. Find all solutions to \( x^2 - 31y^2 = -1 \) and all solutions to \( x^2 - 31y^2 = 1 \).

2. Do exercise #2 on page 356.

3. Do exercise #3 on page 357.

4. Do exercise #11 on page 357.

5. We say an integer \( m \) is a square number if \( m = n^2 \) for some integer \( n \). This makes sense in that one can pictorially represent a square using \( n^2 \) dots. With this in mind, we say an integer \( m \) is a triangle number if it is of the form \( m = 1 + 2 + 3 + \cdots + n \) for some positive integer \( n \). Prove that there are infinitely many numbers \( m \) that are both a square and a triangle, and find the first four such numbers.

Extra Credit for the motivated or bored: Write a computer program to determine the continued fraction expansion of \( \sqrt{d} \) for any positive non-square integer \( d \) and use this to generate a table of the continued fraction expansions for all such \( d \) less than 100. For even more extra credit, have your program find the least positive solution to \( x^2 - dy^2 = \pm 1 \).

The extra credit is not due until Monday, November 30.