PROBLEMS FOR SEPTEMBER'09
DUE OCTOBER 15

1. Squares in the Plane

In the Cartesian plane, consider the set of points

$$A = \{(i,j)|0 \le i,j \le 40, \text{ with } i \text{ and } j integers\}$$

How many squares can be formed so that all corners of all squares belong to A, with sides parallel to the x and y axes?

2. A Cubic Polynomial

For $f(x) = x^3 + 6x^2 - 15x + k$, the absolute maximum and absolute minimum values on the interval $[-10, 2]$ have the same absolute value. Find the value of k.