MATH 3790 - Homework Set 2

Not to be handed in

October 9, 2003

1. Show that $3^n + 2 \cdot 17^n$ is not a perfect square for any n.

2. Let $a, b, c, d, e, f, g, h, i$ be a permutation of $1, 2, 3, 4, 5, 6, 7, 8, 9$. Is it possible that a-b+c-d+e-f+g-h+i=10?

3. If x_i are integers for all $1 \leq i \leq 14$, show that

$$\sum_{i=1}^{14} x_i^4 = 159999$$

has no solutions.

4. Prove that some multiple of $\sqrt{2}$ lies within $\frac{1}{100000}$ of an integer.

5. Pick any 7 points inside a regular hexagon with side length 1. Prove that some pair of points are at most distance 1 from each other.