

Math 3210-1 HW 0  
Due Thursday, June 10, 2004

Do **ONE** of the following problems. It is highly preferable that you do a problem that you have not seen before. These problems will not be graded, but we will discuss them briefly during the next class.

1. (Pythagorean Theorem) Given a right triangle drawn in the plane, whose legs have lengths  $a$  and  $b$ , and whose hypotenuse has length  $c$ , then

$$a^2 + b^2 = c^2.$$

Prove this.

2. (Euclid) There are infinitely many primes. Prove this.
3. There is no rational number whose square is 2. Prove this.
4. (Gauss's Formula) The sum of the first  $n$  natural numbers is  $\frac{n(n+1)}{2}$ . Prove this.