Math 7500 - Test 1 Review

1. Prove there are infinitely many primes
2. Prove $\sqrt{2}$ is not rational
3. Show every square is of the form 4s, 4s+1
4. Name the five regular polyhedra (and describe). Prove that these are the only possible regular polyhedra.
5. I like the inradius outradius ideas, but **not** on the test. Sorry.
6. Diophantine equations.
7. Chinese Remainder Theorem Problems.
8. Know at least one proof of the Pythagorean Theorem.
9. A problem similar to 3.2.1 to 3.2.5
10. A problem similar to 4.4.1 to 4.4.3
11. Continued fractions.
12. Game Theory questions.

    Find the value of a zero sum game. For example,

    (a) A variation of the even odds game. We still have two players who can throw either one or two fingers. Player 1 wins if the sum is even and player 2 wins if the sum is odd. However the payout is the **product** of the fingers thrown.
        i. Write down the payoff table.
        ii. Compute the strategy of the to neutralize the opponents strategy (just as we did in class).
        iii. What is the value of the game?

    (b) A football strategy. An offense can choose pass (P) or run (R) and a defense can choose blitz (B) or Zone (Z). Assume the payoff table is as below. Compute the strategy of the to neutralize the opponents strategy (just as we did in class). What is the value of the game?

		Defense	
		B	Z
Offense	P	-3	10
	R	5	2