

Math 7500 - Test 1

Name: _____

1. State and prove the Pythagorean Theorem. List at least five non-trivial pythagorean triples.

2. Name the five regular polyhedra (and describe) Prove that these are the only possible regular polyhedra.

3. Find all solutions for

$$186x + 264y = 60$$

4. Find the smallest positive solution for n .

$$n \equiv 3 \pmod{5}$$

$$n \equiv 1 \pmod{3}$$

$$n \equiv 2 \pmod{7}$$

5. Continued fractions

- (a) Find the regular value for

$$x = 2 + \frac{1}{2 + \frac{1}{3 + \frac{1}{2 + \frac{1}{3 + \frac{1}{2 + \dots}}}}}$$

- (b) Find the continued fraction expression for $x = \sqrt{3}$
 (c) Find the continued fraction expression for $x = \frac{11}{18}$

6. State De Moivre's Equation. And prove $\cos(4x) = \cos^4(x) - 2\sin^2(x)\cos^2(x) + \sin^4(x)$.

7. Show every square is of the form $4s$, $4s+1$

Name: _____

- Nov 5: Professor Sanacory gives Mathematics Research Talk
- Presentation from Sultan and Artzt given on (Nov 12, Nov 19)

Section for presentation and dates: _____

- Nov 26 Test on CST material
- Research paper Presentations: (Dec 3, Dec 10)

Topic: _____

Date: _____

Main source: _____

Other sources: _____

- Dec 17: Final Exam