Mathematics for College Liberal Arts
Unit 3 Project
Real Number Systems and Number Theory

Instructions: Answer **ALL** questions. You **MUST** show all calculations and/or explanations to justify your answers. Upload the completed project as a Word or PDF file.

1. Find the prime factorization of 300.

2. Tiles will be used to cover an area that is 650 cm × 1,200 cm. What is the largest size square tile that can be used so that all the tiles used are full tiles?

3. The first row of a theater seats 25 people. Each following row seats 2 more people. If there are 80 rows in the theater, how many people, total, can sit in the theater?

4. What is the 15th term of a geometric sequence with first term 5 and common ratio 3?

5. Alice deposits $2,500 in a bond yielding 6% interest compounded annually. How much is the bond worth in 20 years?

6. The moon is 3.844×10^8 m from Earth. A dollar bill has a thickness of 1.0922×10^{-4} m. If dollar bills could be stacked perfectly, how many would it take to reach the moon?

7. Rationalize the denominator of $\frac{2}{10+\sqrt{13}}$

8. Calculate the following: $3 \times \left(\frac{4}{3} \times (14-8)+3\right) - 4 \times \left(8-2^2\right)$

9. Simplify $\left(\frac{9x}{a^2}\right)^5$

10. Alice deposits $2,500 in a bond yielding 6% interest compounded annually. How much is the bond worth in 20 years?