MATH 245- Quiz#2(ZAHEDANI)

Fall 2021

PCC……NAME……

Answer at least five questions:

1) Use the contrapositive to prove:

a) If $x^2 + x + 1$ is an even integer, then x is an odd integer.

b) If "$x + y < 12$, then "$x < 6 \vee y < 6$"

2)

Find a counterexample to each of the following statements:

a) The sum of two prime numbers is also a prime number.

b) The difference of two irrational numbers is irrational.

c) The square of a number is greater than the number itself.

d) For any integer n, $n^2 - 4$ is not divisible by 4.

3) Prove by contradiction:

a) There is no graph with nine vertices of degrees $1, 2, 2, 3, 3, 4, 4, 4.$

b) $5\sqrt{2}$ **is an irrational number.**

4) Prove

a) If x is an integer and x^2 **is even, then** x **is also even.**

b) There is no integer that is both even and odd.

5) **Scheduling Exams**

Use graph coloring to determine the least number of exam times needed and to identify exams that can be given at the same time.

Exams	Students taking this must also take.
Math 101	Math 100, Math 135, Math 130, Math 120
Math 102	Math 135, Math 130, Math 120, Math 110
Math 100	Math 101, Math 135, Math110
Math 135	Math 100, Math 101, Math 102, Math 110, Math 120, Math 130
Math 130	Math 135, Math 101, Math 102, Math 120
Math 120	Math130, Math 135, Math 101, Math 102, Math 110
Math 110	Math 120, Math 102, Math 135, Math 100

6) **Draw the bipartite graph $K_{2,3}$ and the complete graph K_4. What is the chromatic number of each graph?**