Lecture 4: Quiz

Name:

Problem 1

What is a prime number?
a) A positive integer n which is only divisible 1 only.
b) A number n which is not divisible by any number.
c) A positive integer $n > 1$ which is only divisible by 1 or n.
d) A number larger than 1 which is the sum of its proper factors.

Problem 2

Which theorem assures that $2^7 - 2$ is divisible by 7
a) Fermat's little theorem
b) Wilson's theorem
c) Chinese remainder theorem

Problem 3

Which of the following statements is called **Wilson's theorem**:
a) $(n-1)! + 1$ is divisible by n.
b) $(n! - 1)$ is divisible by n.
c) $(n! + 1)$ is divisible by n.
d) $(n+1)! - 1$ is divisible by n. e) $(n-1)! - 1$ is divisible by n.

Problem 4

Two of the following numbers is a **perfect number**. Which ones?
a) 2
b) 4
c) 6
d) 28
e) 100

Problem 5

Which of the following theorems can be used to see without any doubt that a number is a prime numbers?
a) Fermat's little theorem.
b) The Chinese remainder theorem.
c) Wilson's theorem
d) Euclid's theorem on the infinity of primes.
e) The structure of perfect numbers.

Problem 6

Which of the following theorems or conjectures are open problems in mathematics?
a) Goldbach's
b) Andrica's
c) Fermat's
d) Twin prime
e) The infinity of the primes
f) The existence of odd perfect numbers.

Problem 7

Which of the following statements are theorems?
a) There are infinitely many cousin primes $p, p+6$.
b) There are arbitrary large gaps between primes.
c) There are infinitely many primes.
d) There are infinitely many prime twins.
e) Primes on the Ulam spiral produce an organic pattern.

Problem 8

Who proved first that there are infinitely many primes?
a) Gauss
b) Euclid
c) Eudoxos
d) Euler
f) Andrica

Problem 9

Which feature movie shows the Ulam Spiral?
a) Enigma
b) Sneakers
c) Conspiracy theory
d) Good will hunting.
e) The number 23.