

Lecture 4: Quiz

Name:

Problem 1

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 2

Which of the following numbers is a **perfect number**?

- a) 2
- b) 3
- c) 6
- d) 28
- e) 100

Problem 3

Which of the following theorems can be used to define whether a number is a prime numbers:

- a) Fermats 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 4

Which of the following are open problems in mathematics?

- a) Andrica's theorem
- b) Fermat's last theorem
- c) Goldbach's conjecture
- d) Twin prime conjecture
- e) The infinity of the primes
- f) The existence of odd perfect numbers.

Problem 5

Which of the following facts are known?

- a) There are arbitrary large gaps between primes.
- b) There are infinitely many primes.
- c) There are infinitely many sexy primes $p, p + 6$.
- d) There are infinitely many prime twins.
- e) The primes on the Ulam spiral produce a beautiful organic pattern.

Problem 6

Who proved first that there are infinitely many primes?

- a) Gauss
- b) Euclid
- c) Eudoxos
- d) Euler
- e) Wilson
- f) Andrica
- g) Ulam

Problem 7

Which movie features the Ulam Spiral?

- a) Enigma
- b) Sneakers
- c) Conspiracy theory
- d) Good will hunting.
- e) The number 23.