History of Number Theory

Number Theory · Answer Key · 25 Questions

1. Which ancient clay tablet, dating to the Old Babylonian period, contains a list of Pythagorean triples?

A) Plimpton 322
B) Rhind Papyrus
C) Moscow Papyrus
D) Berlin Papyrus

2. Who is credited with providing the first rigorous proof of the Infinitude of Primes in his work 'Elements'?

A) Archimedes
B) Euclid
C) Pythagoras
D) Diophantus

3. Pierre de Fermat famously claimed to have a proof for which theorem in the margin of his copy of Diophantus's 'Arithmetica'?

A) Fermat's Little Theorem
B) Fermat's Polygonal Number Theorem
C) Fermat's Last Theorem
D) Fermat's Two-Square Theorem

4. Which mathematician finally proved Fermat's Last Theorem in 1994?

A) Andrew Wiles
B) Leonhard Euler
C) Carl Friedrich Gauss
D) Kurt Gödel

5. The study of modular arithmetic was formalized in the 1801 book 'Disquisitiones Arithmeticae' by which mathematician?

A) Bernhard Riemann
B) Joseph-Louis Lagrange
C) Carl Friedrich Gauss
D) Augustin-Louis Cauchy

6. Which 18th-century mathematician discovered the formula relating the sum of the reciprocals of primes to the natural logarithm?

A) Leonhard Euler
B) Isaac Newton
C) Gottfried Leibniz
D) Brook Taylor

7. The Goldbach Conjecture, proposed in 1742, suggests that every even integer greater than 2 is the sum of two what?

A) Perfect numbers
B) Prime numbers
C) Triangular numbers
D) Square numbers

8. What is the name of the function, denoted by phi(n), that counts the positive integers up to n that are relatively prime to n?

A) Euler's totient function
B) Riemann zeta function
C) Mobius function
D) Dirichlet function

9. Which mathematician developed the 'Sieve of Eratosthenes', an ancient algorithm for finding all prime numbers up to any given limit?

A) Eratosthenes of Cyrene
B) Hypatia of Alexandria
C) Pappus of Alexandria
D) Apollonius of Perga

10. The 'Arithmetica', a major work on number theory that influenced Fermat and others, was written by whom?

A) Diophantus
B) Plato
C) Thales
D) Hipparchus

11. In 1859, Bernhard Riemann published a paper that introduced which famous function, central to the study of prime number distribution?

A) Riemann zeta function
B) Gamma function
C) Beta function
D) Elliptic function

12. The 'Prime Number Theorem', describing the asymptotic distribution of prime numbers, was independently proved in 1896 by which two mathematicians?

A) Hadamard and de la Vallée Poussin
B) Hardy and Littlewood
C) Hilbert and Cantor
D) Cauchy and Abel

13. Which English mathematician is known for his extensive work on the distribution of primes and his collaboration with Ramanujan?

A) G.H. Hardy
B) Alan Turing
C) Charles Babbage
D) Bertrand Russell

14. Srinivasa Ramanujan, a self-taught mathematical genius, made significant contributions to number theory from which country?

A) India
B) Japan
C) Brazil
D) South Africa

15. The 'Law of Quadratic Reciprocity' was first conjectured by Euler and Legendre, but the first published proof was provided by whom?

A) Carl Friedrich Gauss
B) Pierre de Fermat
C) Blaise Pascal
D) Joseph Fourier

16. Which 17th-century French mathematician and monk conducted extensive correspondence on number theory and is the namesake of the Mersenne primes?

A) Marin Mersenne
B) René Descartes
C) Blaise Pascal
D) Pierre Gassendi

17. Sophie Germain made a major breakthrough toward proving Fermat's Last Theorem by proving the result for a specific class of primes now known as:

A) Sophie Germain primes
B) Gaussian primes
C) Mersenne primes
D) Fermat primes

18. What is the name of the constant, denoted by gamma, that appears in the context of the harmonic series and Euler-Mascheroni?

A) Euler-Mascheroni constant
B) Feigenbaum constant
C) Khinchin constant
D) Landau constant

19. The 'ABC conjecture', a major unsolved problem in number theory, deals with the relationship between the radical of the product of three coprime integers, and was proposed in:

A) 1985
B) 1750
C) 1920
D) 2005

20. Which mathematician introduced the concept of 'Gaussian integers' (numbers of the form a + bi where a and b are integers)?

A) Carl Friedrich Gauss
B) Augustin-Louis Cauchy
C) Niels Henrik Abel
D) Évariste Galois

21. The 'Four-Square Theorem', stating that every natural number can be represented as the sum of four integer squares, was proved by:

A) Joseph-Louis Lagrange
B) Pierre de Fermat
C) John Wallis
D) Isaac Barrow

22. What is the name of the 19th-century mathematician who contributed significantly to number theory through his work on the 'Dirichlet series'?

A) Peter Gustav Lejeune Dirichlet
B) Carl Jacobi
C) Karl Weierstrass
D) Bernhard Riemann

23. A 'Perfect number' is a positive integer that is equal to the sum of its proper divisors. Which is the smallest perfect number?

A) 6
B) 8
C) 10
D) 12

24. Which mathematician formulated the 'Prime Number Theorem' as a conjecture based on analyzing tables of primes?

A) Adrien-Marie Legendre
B) Carl Friedrich Gauss
C) Leonhard Euler
D) Joseph-Louis Lagrange

25. The 'Wolfskehl Prize' was established in 1908 to reward the proof of which famous mathematical problem?

A) Fermat's Last Theorem
B) Goldbach Conjecture
C) Twin Prime Conjecture
D) Riemann Hypothesis