

For all questions, answer choice "E) NOTA" means none of the above answers is correct.

1. Which of the following pairs of mathematicians credibly and separately developed non-Euclidean geometry? (Gauss is not included in this because of the lack of evidence in his favor other than his own testimony.)
A) Farkas Bolyai & Riemann B) Janos Bolyai & Lobachevsky C) Cauchy & Legendre
D) Abel & Jacobi E) NOTA
2. Which of the following describes the tendency in statistics for a counterintuitive distribution of the first digit of elements in a given set of numbers?
A) Russell's Paradox B) Dmitri's Principle C) Benford's Law D) The Gauss Conjecture
E) NOTA
3. Which one of the following is NOT analogous with the others?
A) Euclid's Orchard B) The Dirichlet Function C) Roberval's Trochoid
D) Thomae's Function E) NOTA
4. Commonly confused with Euclid's quote concerning the "royal road to geometry", what mathematician told Alexander the Great, "O King, for traveling over the country there are royal roads and roads for common citizens; but in geometry there is one road for all"?
A) Menaechmus B) Dinostratus C) Autolycus D) Aristotle E) NOTA
5. Who were the two mathematicians that are said to have cofounded probability?
A) Fermat & Gauss B) Gauss & Cauchy C) Riemann & Cauchy D) Pascal & Dirichlet
E) NOTA
6. Suppose you are asked to play a game in which your bet goes double or nothing each time you successfully flip a fair coin and get a head. What is the name of this rule in decision theory which dictates how much money you ought to bet initially? (Hint: this game would lead to an infinite expected payoff)
A) Russell's Paradox B) Cavilieri's Principle C) Pascal's Theorem
D) The St. Petersburg Paradox E) NOTA
7. *Pons asinorum* refers to which of the following propositions of Euclid's *Elements*?
A) II.3 B) IV.6 C) I.5 D) V.2 E) NOTA

8. Which of the following Millennium Problems had an attempted solution within the past two years by Vinay Deolalikar?

- A) P vs. NP B) Birch & Swinnerton-Dyer Conjecture C) Hodge Conjecture
D) Yang-Mills Existence & Mass Gap E) NOTA

9. Where is Andrew Wiles' birth country, and at what university does he teach?

- A) Germany, Harvard B) Great Britain, MIT C) Great Britain, Princeton
D) Germany, Oxford E) NOTA

10. What is the name of the famous hymn writer who wrote a mathematical textbook entitled *Logic: the Right Use of Reason in the Inquiry After Truth*?

- A) Isaac Watts B) Samuel Gottfried C) Friar Blenkinsop D) Chester Allen E) NOTA

11. Who disproved Euler's sum of powers conjecture?

- A) Noam Elkies B) L.J. Lander & T.R. Parkin C) Roger Frye D) William Thurston E) NOTA

12. Gauss has a famous headstone. It is in part due to the mistake on the part of the masons who made it. Gauss discovered that regular polygons can be constructed when the number of sides is what type of number?

- A) Sophie Germain Number B) Gauss Prime C) Wilson Number D) Fermat Prime
E) NOTA

13. What is the name of the collaborative computer prime finding software which recently discovered the world's largest Mersenne prime?

- A) CCP B) MARK C) GIMPS D) EPCONN E) NOTA

14. What is the pseudonym chosen by a group of French mathematicians in the mid-1930s who went on to make impacts in the fields of analysis and geometry?

- A) Henry Poincare B) Nicolas Bourbaki C) Jonas Salyer D) Igor Soulitan E) NOTA

15. Which of the following Egyptian mathematical papers outlines the method for finding the volume of a frustum?

- A) The Rhind Papyrus B) Plimpton 322 C) The Berlin Papyrus D) The Rosetta Stone
E) NOTA

16. What famous mathematician had three dreams which prompted him to begin to study and publish work regarding reason and logic?

- A) Blaise Pascal B) Gregory Perelman C) Evariste Galois D) Rene Descartes E) NOTA

17. Johannes Kepler said, "Geometry has two great treasures: one is the Theorem of Pythagoras; the other, the division of a line into extreme and mean ratio. The first we may compare to a measure of gold; the second we may name a precious jewel." What was the second treasure of which Kepler spoke?

- A) The Golden Ratio B) Euler's Theorem C) Bertrand's Paradox D) The Pi Equation
E) NOTA

18. Which of the following is NOT one of the great ancient Greek problems?

- A) squaring the circle B) the Delian Problem C) trisecting the angle
D) non-parallel measurements E) NOTA

19. Who was the father of the first woman mathematician?

- A) Plato B) Theon C) Heron D) Ptolemy E) NOTA

20. The quadratrix or trisectrix of Hippias can be used in solving which of the following problems?

- A) squaring the circle B) Fermat's Little Theorem C) Law of Cosines
D) The Bernoulli Problem E) NOTA

21. Which of the following bases was heavily used in Babylonian mathematics?

- A) 5 B) 20 C) 7 D) 60 E) NOTA

22. Who is known as the father of scientific astronomy?

- A) Plato B) Eudoxus C) Dinostratus D) Archimedes E) NOTA

23. What problem did Euler solve and, in doing so, establish the field of topology?

- A) The King's Crown B) The Bean Counting Problem C) The Prime Number Theorem
D) Hilbert's Problem E) NOTA

24. The fact that the points on a line can be put in a one-to-one correspondence with the real numbers is known as what?

- A) Mandelbrot's Theorem B) Leonardo's Principle C) Cantor-Dedekind Axiom
D) Legendre's Postulate E) NOTA

25. Which of the following of Hilbert's Problems, delivered in 1900, cannot have a solution under Godel's Incompleteness Theorem?

- A) Compatibility of arithmetic axioms B) The Riemann Hypothesis
C) Schubert's enumerative geometry D) Fermat's Last Theorem E) NOTA

26. Which mathematician provided vast advancements in the areas of algebra and group theory before his untimely death in a duel at the age of 21?

- A) Abel B) Galois C) Jacobi D) Legendre E) NOTA

27. Which of the following is the second smallest taxicab number?

- A) 34857 B) 17 C) 6473 D) 1729 E) NOTA

28. If I was doing calculus and referring to fluxions, whose notation of calculus would I be utilizing?

- A) Gottfried Leibniz B) Georg Cantor C) Isaac Newton D) Lagrange E) NOTA

29. Using one half the determinant of a square matrix with Cartesian coordinates in the first two columns and all ones in the third column will yield the area of a triangle with vertices at given points. To whom do we owe this discovery?

- A) Lagrange B) Laplace C) Legendre D) Dirichlet E) NOTA

30. Which of the following would be a direct consequence of proving the Riemann Hypothesis to be true?

- A) Axiomatization of arithmetic B) Closed-structure geometry C) Proof of Abelian circuits
D) Full proof of the Prime Number Theorem E) NOTA