2002 National Mu Alpha Theta Convention
Open Division
History of Mathematics-Topic Test

1. Which of the following fractions was not expressible as a single fraction in Egyptian Notation?

   A. 1/5
   B. 2/3
   C. 5/8
   D. 1/9
   E. More than one of the Above

2. Which of the following Rulers is associated with a famous bean counting problem?

   A. Sun Tsu
   B. Napoleon
   C. Caesar
   D. Ghengis Kahn
   E. NOTA

3. In what base did the Mayans express their numbers?

   A. 5
   B. 10
   C. 20
   D. 60
   E. NOTA

4. Who was the father of Hypatia (who is frequently regarded as the first female mathematician)?

   A. Euclid
   B. Archimedes
   C. Theon
   D. Apollonius
   E. Diophantus

5. Euclid's *Elements* was a thirteen book collection which contained theorems and proofs in all of these areas except:

   A. Number Theory
   B. Plane Geometry
   C. Solid Geometry
   D. Probability
   E. NOTA

6. Which of the following theorems **originated** with the Pythagoreans:

    A. The square of the hypotenuse of a right triangle is equal to the sum of the squares of the two legs
    B. There exist numbers which are not comeasurable
    C. It is not possible to trisect an angle by Greek construction rules
    D. There are an infinite number of perfect numbers
    E. All of the above theorems originated with the Pythagoreans

7. This mathematician is regarded as one of the greatest of all time. He is responsible for determining formulas for surface area and volume of a sphere, the method of infinite descent, as well as a hydrological devise still in use today, which bears his name. Who is he?

    A. Eudoxus
    B. Heron
    C. Archimedes
    D. Apollonius
    E. NOTA

8. Which of Euclid's axioms did mathematicians at first believe did not need axiom status and thus tried to prove it from the other four until it was proven that this was impossible? Minor alterations of this axiom lead to areas such as spherical and hyperbolic geometry.

    A. To draw a straight line from any point to any point
    B. To produce a finite straight line continuously in a straight line
    C. To describe a circle with any center and distance
    D. All right angles are equal to one another
    E. If a straight line falling on two straight lines make the interior angles on the same side less than two right angles, the two straight lines, if produced indefinitely, meet on that side on which the angles are less than the two right angles.

9. Which of the following mathematicians proposed a method of approximating pi which involved inscribing and circumscribing increasingly many sided polygons about a circle?

    A. Erastothenes
    B. Archimedes
    C. Euclid
    D. Apollonius
    E. NOTA

10. Which ancient text contains the line, “Then He made the molten sea, ten cubits from brim to brim, while a line of 30 cubits measured it around”?

    A. The Bible
    B. The Dead Sea Scrolls
    C. The Rhind Papyrus
    D. The Rossetta Stone
    E. NOTA

11. Which Greek mathematician wrote *Metrica* in which he gives a formula for determining the area of a triangle?

    A. Pythagorus
    B. Heron
    C. Euclid
    D. Archimedes
    E. NOTA

12. This Greek mathematician is credited with a remarkably accurate approximation of the circumference of the Earth.

    A. Archimedes
    B. Heron
    C. Erastothenes
    D. Plato
    E. NOTA

13. The paradoxes of motion which this Greek created taunted mathematicians for centuries. Some of these include “Achilles and the Tortoise” and “The Arrow”.

    A. Zeno of Elea
    B. Apollonius
    C. Archimedes
    D. Aristotle
    E. NOTA

14. This mathematician’s *Arithemetica* discusses solutions of systems such as ax+by=c in integers only.

    A. Diophantus
    B. Theon
    C. Archimedes
    D. Integres
    E. NOTA

15. Who was the scribe who copied the Rhind Papyrus?

A. Ahmes
B. Rhind
C. Tutus
D. Maimes
E. NOTA

16. From which culture does our system of time stem?

A. Babylonian
B. Egyptian
C. Greek
D. Roman
E. NOTA

17. It is often said that the Fields Medal is like a Nobel Prize for mathematics, even though they are technically unrelated. Yet when Andrew Wiles proved Fermat's Last Theorem, a famous problem which has haunted mathematicians for many years, he did not receive the Fields Medal. Why?

A. Even though Fermat's Last Theorem was a historically significant problem, it was not considered to be of large mathematical value.
B. The Fields Medal is not given to people over 40
C. Wiles was on the committee which distributed the Fields Medals, and thus could not receive it
D. Wiles died shortly after completing his proof, and the Fields Medal cannot be given post mortum.
E. NOTA

18. Cardano was the first to publish a solution in radicals for cubic equations, however, he had actually stolen the result from whom?

A. Tartaglia
B. Fermat
C. Viète
D. Fibonocci
E. NOTA

19. Which of the following wrote *Liber abbaci*, in which he discussed a famous rabbit problem?
    A. Leonardo of Pisa
    B. Galileo
    C. Fermat
    D. Abel
    E. NOTA

20. Who wrote the words, "If I have seen further it is by standing on the shoulders of Giants." in a letter he wrote to Robert Hooke.

    A. Pascal
    B. Einstein
    C. Galileo
    D. Newton
    E. NOTA

21. In the margin of what book did Fermat scribble, "Cubum autem in duos cubos, aut quadratoquadratum in duos quadratoquadratos, et generaliter nullam in infinitum ultra quadratum potestatem in duos ejusdem nominis fas est dividere: cujus rei demonstrationem mirabilem sane detexi. Hanc marginis exiguitas non caperet."

    A. The Elements
    B. Arithmetica
    C. Principia Mathematica
    D. Liber Abbaci
    E. NOTA

22. To whom is the following function attributed:

$$f(x) = \begin{cases} 1 \text{ if x is rational} \\ 0 \text{ if x is irrational} \end{cases}$$

    A. Dirchlet
    B. Diophantus
    C. Dedekind
    D. De Morgan
    E. NOTA

23. Turing, Babbage, and Lovelace are all affiliated with which of the following?

    A. Computers
    B. Physics
    C. Economics
    D. Slide Rules
    E. NOTA

24. The sequence: 2, 1 ,3, 4, 7, 11, 18… follows the same rules of generation as the Fibonocci numbers, but is named after another mathematician. For whom is this sequence named?

    A. Fermat
    B. Abel
    C. Lucas
    D. Leonardo DiVinci
    E. NOTA

25. Dedekind is affiliated primarily with the study of which of the following?

    A. Irrational Numbers
    B. Prime Numbers
    C. Perfect Numbers
    D. Triangular Numbers
    E. NOTA

26. Which of the following mathematicians proved that pi is transcendental?

    A. Liouville
    B. Lindemann
    C. Dedekind
    D. Hermite
    E. NOTA

27. In the year 1900 this mathematician created a list of 23 major problems of mathematics which he thought were important to mathematics in the coming century, 12 of them remain unsolved to this day. Who is he?

    A. Whitehead
    B. Hilbert
    C. Dedekind
    D. Hardy
    E. NOTA

28. This mathematician wrote *A Mathematicians Apology*, a flaming defense of the study of pure mathematics. He also co-authored a very famous introduction to number theory.

A. Russell
B. Wright
C. Hardy
D. Jacobi
E. NOTA

29. Which of the following mathematicians did not participate in the writing of a book entitled *Principia Mathematica*?

A. Russell
B. Newton
C. Gauss
D. Whitehead
E. NOTA

30. Gauss requested that a 17-gon be constructed on his grave, to commemorate his proof that regular polygons with a number of sides of what form can be constructed (when n is an integer)?

A. 2n+1
B. n^2+1
C. 9n-2
D. $2^{2^n}+1$

E. NOTA

31. Which of the following presidents provided a proof of the Pythagorean Theorem?

A. Washington
B. Wilson
C. Garfield
D. Lincoln
E. NOTA

32. This mathematician, who was actually a lawyer by profession, helped to standardize the notations of algebra, and was also responsible for an approximation of pi accurate to nine decimal places.

A. Fermat
B. Viète
C. Cardano
D. Ferrari
E. NOTA

33. Which of the following is a worldwide prime search that can be downloaded by interested parties and run on their computer?

A. MUPS
B. GIMPS
C. PPP
D. TSFP
E. NOTA

34. Lewis Carroll, author of *Alice in Wonderland*, wrote heavily in which of the following areas?

A. Inequalities
B. Logic
C. Geometry
D. Number Theory
E. All of the Above

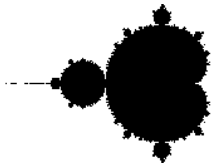
35. Which monk conjectured that any even number greater than 4 could be expressed as the sum of two odd primes?

A. Mersenne
B. Ruffini
C. Goldbach
D. Mendel
E. NOTA

36. Which area of math features ideas such as groups, fields, rings, and ideals?

A. Set Theory
B. Game Theory
C. Chaos Theory
D. Modern Algebra
E. NOTA

37. With which mathematician is the following picture associated?



A. Mandelbrot
B. Cantor
C. Koch
D. Julia
E. NOTA

38. Take an equilateral triangle. Trisect each side, remove the middle, and then connect the broken sides along the edges of an equilateral triangle. Repeat ad infinitum. The fractal that is generated is associated with which mathematician?

A. Mandelbrot
B. Cantor
C. Koch
D. Julia
E. NOTA

39. Which of the following mathematicians is famous for translating Newton's *Principia Mathematica*?

A. Chatelet
B. Agnesi
C. Kovoleskaya
D. Lovelace
E. NOTA

40. Ferrari was the first to solve the quartic equation in radicals. His solution had 20 parts, although it has since been simplified. Whose student was he?

A. Cardano
B. Tartaglia
C. Viète
D. Fermat
E. NOTA

41. It is well known that Galois died in a duel. Some speculate that it was over political issues, and others speculate it was over love. Galois' writings contain many references to this female, with whom it can only be assumed that he was in love.

    A. Sarah
    B. Stephanie
    C. Emillie
    D. Claudine
    E. NOTA

42. Who wrote a book that would later come to be known as *The Almagest* after it came into Arabic hands?

    A. Heron
    B. Hipparchus
    C. Ptolemy
    D. Grossette
    E. NOTA

43. This mathematician wrote *How to Solve It*, in which he demonstrates a method of mathematical thought and suggests a way to teach not only mathematics but also thinking and problem solving?

    A. Babbage
    B. Polya
    C. Bolyai
    D. Abbott
    E. NOTA

44. Which of the following is generally attributed with writing the first computer program?

    A. Chatelet
    B. Agnesi
    C. Kovoleskaya
    D. Lovelace
    E. NOTA

45. Who authored *Flatland*, a book about a two-dimensional world, staring a square as the protagonist?

    A. Abbot
    B. Carol
    C. Russell
    D. Poincaré
    E. NOTA

History of Math –Open Division
Answer Key

Answers:

1. C
2. A
3. C
4. C
5. D
6. B
7. C
8. E
9. B
10. A
11. B
12. C
13. A
14. A
15. A
16. A
17. B
18. A
19. A
20. D
21. B
22. A
23. A
24. C
25. A
26. B
27. B
28. C
29. C
30. D
31. C
32. B
33. B
34. B
35. C
36. D
37. A
38. C
39. A
40. A
41. B
42. C
43. B
44. D
45. A