1. The Babylonians and other Ancient Mesopotamian Civilizations used what number as a base?
    a. 60
    b. 20
    c. 12
    d. 8
    e. NOTA
2. This mathematician proposed his Rule of Signs his 1637 book, *La Geometrie*.
    a. Rene Descartes
    b. Blaise Pascal
    c. Marin Mersenne
    d. Johannes Kepler
    e. NOTA
3. This mathematician attempted to find a proof of the parallel postulate. In 1832, this mathematician documented his discovery of Non-Euclidean Geometry in his *Appendix*.
    a. Arthur Cayley
    b. Janos Bolyai
    c. Nikolai Lobachevsky
    d. Carl F. Gauss
    e. NOTA
4. This city was the center of Islamic Mathematics from the Ninth to the Thirteenth Centuries. Caliph Al-Mamun's House of Wisdom was located here, and many of the innovations of Al-Kindi, Al-Khwarizmi, and others happened in this city.
    a. Baghdad
    b. Damascus
    c. Bukhara
    d. Cairo
    e. NOTA
5. This Indian mathematician used a method he called the *kuttuka* (pulveriser) to find general solutions to linear Diophantine equations. His most famous book describes a method to generate solutions to Pell's equations, and is the first known description of arithmetic using negative numbers and zero.
    a. Varahamihara
    b. Aryabhata I
    c. Brahmagupta
    d. Bhaskara II
    e. NOTA
6. This Greek mathematician wrote *The Method*, in which he derived formulas for the volumes of a cylinder, sphere, and cone.
    a. Eudoxus of Cnida
    b. Euclid
    c. Archimedes
    d. Apollonius of Perga
    e. NOTA

7. This “Father of Accounting and Bookkeeping” wrote *Summa de arithmetica*, which contains a comprehensive overview of Medieval and Renaissance mathematics. He also wrote *Divina Proportione*, which documented his obsession with the Golden Ratio.
    a. Piero della Francesca
    b. Leonardo Da Vinci
    c. Albrecht Durer
    d. Luca Pacioli
    e. NOTA
8. This female mathematician contributed greatly to abstract algebra by developing ring theory and field theory.
    a. Ada Lovelace
    b. Emmy Noether
    c. Sophie Germain
    d. Emilie du Chatelet
    e. NOTA
9. Which of these was NOT developed in India?
    a. Concept of Zero
    b. Positional Numerals
    c. Negative numbers
    d. Decimal point
    e. NOTA
10. This is the first Chinese mathematical work to provide a proof of the Pythagorean Theorem.
    a. Zhoubi Suanjing
    b. Mo Jing
    c. Nine Chapters on the Mathematical Art
    d. Haidao Suanjing
    e. NOTA
11. In addition to writing *Treatise on Demonstration of Problems of Algebra*, in which he gives general solutions to cubic equations, this mathematician measured the length of the year very accurately and used these measurements for calendar reform.
    a. Al-Biruni
    b. Al-Khwarizmi
    c. Al-Tusi
    d. Khayyam
    e. NOTA
12. In his *Conics*, this author defines a general double-napped cone as “All lines that pass through a circle and a non-coplanar point.”
    a. Menaechmus
    b. Apollonius of Perga
    c. Pappus
    d. Hypatia
    e. NOTA

13. This mathematician and astronomer was the first to determine latitude and longitude using stars in the night sky. He also contributed to trigonometry and is thought to have created the first trigonometric table.
    a. Theon of Alexandria
    b. Hipparchus of Nicaea
    c. Menelaus of Alexandria
    d. Aristarchus of Samos
    e. NOTA
14. Lagrange proved his Four-Square theorem in 1770. Which mathematician below stated the same theorem, with no surviving proof, over a century earlier?
    a. Albert Girard
    b. John Napier
    c. Blaise Pascal
    d. Pierre de Fermat
    e. NOTA
15. Which of the following feats is not usually attributed to Archimedes?
    a. Inventing a screw for pumping water
    b. Inventing many machines to defend Syracuse, such as catapults.
    c. A water-powered moving sphere to represent the sun, moon, and planets
    d. Buying olive presses, and making money by renting them when demand peaked
    e. NOTA
16. Formulas that this Swiss mathematician developed to calculate π include: $\frac{1}{1^2}+\frac{1}{2^2}+\frac{1}{3^2}+\ldots=\frac{\pi^2}{6}$ (which he worked on with the Bernoulli family), $\frac{4}{3}\cdot\frac{9}{8}\cdot\frac{25}{24}\cdot\frac{49}{48}\cdot\frac{121}{120}\cdot\ldots=\frac{\pi^2}{6}$, and $arctan(\frac{1}{2})+arctan(\frac{1}{8})+arctan(\frac{1}{18})\ldots=\frac{\pi}{4}$.
    a. Gottfried Leibniz
    b. Leonhard Euler
    c. Adrien-Marie Legendre
    d. Carl F. Gauss
    e. NOTA
17. This mathematician first proved the Generalized Binomial Theorem with non-integral exponents. He also developed calculus and stated his 3 laws of motion in his work *Philosophae Naturalis Principia Mathematica*.
    a. Michael Stifel
    b. Blaise Pascal
    c. Simon Stevin
    d. Isaac Barrow
    e. NOTA

18. This mathematician and philosopher contributed to combinatorics in his work *De Arte Combinatoria*. He also invented Calculus in his work *Nova Methodus pro Maximis et Minimis*.
    a. Blaise Pascal
    b. Pierre de Fermat
    c. Gottfried Leibniz
    d. George Berkeley
    e. NOTA
19. Carl Friedrich Gauss left many cryptic messages in his diary, including a statement that every positive integer can be written as the sum of AT MOST 3 of these of numbers.
    a. Perfect Squares
    b. Perfect Powers (squares, cubes, fourth powers, etc.)
    c. Fibonacci Numbers
    d. Triangular Numbers
    e. NOTA
20. This mathematician developed descriptive geometry, allowing him to represent 3-D objects on paper. Lagrange was fascinated by this mathematician's geometry when he sat in on his lectures at the *Ecole Normale Superieure*. He was appointed by Napoleon to govern Egypt.
    a. Gaspard Monge
    b. Jean D'Alambert
    c. Pierre-Simon Laplace
    d. Adrien-Marie Legendre
    e. NOTA
21. This city was the center of mathematics in the Hellenistic and Classical Eras. Mathematicians who did most of their work here include Heron, Pappus, Ptolemy, and Hypatia.
    a. Athens
    b. Alexandria
    c. Constantinople
    d. Antioch
    e. NOTA
22. This mathematician's innovations in studying groups and fields led to many important mathematical developments. His ideas allowed later mathematicians to prove that the 3 Greek Problems of Antiquity were unsolvable.
    a. Evariste Galois
    b. Niels Henrik Abel
    c. Augustin-Louis Cauchy
    d. Arthur Cayley
    e. NOTA

23. In an 1854 lecture on differential geometry, this mathematician laid much of the groundwork for the revising of Euclid's Postulates and the development of higher-dimensional geometry. During his lifetime, this mathematician mainly focused on local, differential geometry.
    a. August Mobius
    b. William R. Hamilton
    c. Arthur Cayley
    d. Ludwig Schlafli
    e. NOTA
24. This mathematician attempted to axiomatize geometry by stating Euclid's implicit assumptions. He was able to show that geometry is consistent if arithmetic is consistent, but he could not prove that arithmetic was consistent. Proving the consistency of arithmetic was the 2nd problem in a list of 23 problems named after this mathematician.
    a. Henri Poincare
    b. Giuseppe Peano
    c. David Hilbert
    d. Bertrand Russell
    e. NOTA
25. This physicist, the only physicist to win the Fields Medal, is the leading proponent of String Theory/M-Theory, and based most of his original physics developments on geometry and topology.
    a. John Schwarz
    b. Murray Gell-Mann
    c. Edward Witten
    d. Yoichiro Nambu
    e. NOTA
26. Mathematics in this country in the early 19th century focused more on the development of a rigorous Algebra than on solving existing Algebraic problems. Symbolical Algebra and Boolean Algebra were mainly developed in this country.
    a. Britain
    b. France
    c. Germany
    d. United States
    e. NOTA
27. This mathematician's namesake "cut" constructs the real numbers by dividing the rational numbers into 2 non-overlapping regions. His work in real analysis allowed for a non-geometric definition of limits and continuity. Although his work *Stetigkeit und irrationale Zahlen* contributed to the theory of infinite sets, he incorrectly believed that all infinite sets are the same size.
    a. Hermann Hankel
    b. Karl Weierstrass
    c. Richard Dedekind
    d. Georg Cantor
    e. NOTA

28. If you lived in this civilization and wanted to write a fraction, you would generally have to decompose that fraction into a sum of fractions with numerator 1, although you could also use $\frac{2}{3}$ or $\frac{3}{4}$.
    a. Maya
    b. Indus Valley
    c. Babylon
    d. Ancient Egypt
    e. NOTA
29. This mathematician published other mathematicians' solutions to general cubic and quartic equations in his book, *Ars Magna.*
    a. Ludovico Ferrari
    b. Niccolo Tartaglia
    c. Rafael Bombelli
    d. Gerolamo Cardano
    e. NOTA
30. In the early 20th century, this country saw many developments in the study of linked chain processes. The most-used axioms of probability were developed in this country.
    a. United States
    b. France
    c. Japan
    d. Russia/Soviet Union
    e. NOTA