A Time-line for the History of Mathematics  
(Many of the early dates are approximates)  
http://www.math.wichita.edu/~richardson/timeline.html  
This work is under constant revision, so come back later. Please report any errors to me at richardson@math.wichita.edu.

It should be noted that the brief descriptions given are just that "brief." Their purpose is to hopefully instill a little curiosity and encourage the reader to seek out further knowledge on these people and topics.

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| 50,000 B.C.E. |  | Evidence of counting | 50,000 B.C.E. |  | Neanderthal man |
| 25,000 B.C.E. |  | Primitive geometrical designs | 25,000 B.C.E. |  | Paleolithic art: Cro-Magnon man |
|  |  |  | 4000 B.C.E. |  | Use of metals |
|  |  |  | 3500 B.C.E. |  | Writing |
| 3000 B.C.E. |  | [Hieroglyphic numerals in Egypt Hieroglyphics for numbers were introduced around 3000 BCE. The number glyphs were: a stroke, or staff, onefor one; a heel bone 10for 10; a coil of rope 100for 100; a lotus flower 1000for 1000; a pointing finger 10000for 10,000; a borbot fish (or tadpole) 100000for 100,000; and an astonished man millionfor 1,000,000. Clearly their number system was a base ten system; however, they used a simple grouping system rather than a positional system.](http://www.math.wichita.edu/%7Erichardson/timeline.html) | 3000 B.C.E. |  | [Use of wheeled vehiclesWheeled vehicles first appeared in Mesopotamia (the region between the Tigris and the Euphrates Rivers ) around 3000 B.C.E. They were originally four-wheel vehicles drawn by slow-moving animals. The wheels on the earliest vehicles were fixed to the axles rather than rotating around a hub. The axles themselves were held in place with wooden pegs on each side of the axle. The axle rotated against the bed of the vehicle and this probably helped round the axles.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
| 2773 B.C.E. |  | Likely introduction of the Egyptian calendar (Some hypothesize 4241 B.C.E. as the origin.) |  |  |  |
|  |  |  | 2500 B.C.E. |  | [Great PyramidThe Great Pyramid was built by the Egyptian pharaoh Khufu (also known as Cheops) of the Fourth Dynasty around the year 2500 BCE to serve as a tomb for when he died. This pyramid is believed to have been built over a 20-30 year period and it is the only survivor of the Seven Wonders of the Ancient World. It is properly referred to as the Great Pyramid of Giza. The site was first prepared by leveling the surface and then blocks of stone were transported and placed. It was finished with an outer casing which was used to smooth the surface. This outer surface has long ago disappeared.   Some interesting data: it is 756 feet long on each side, 480 feet high and is composed of approximately 2,300,000 blocks of stone, each averaging 2 1/2 tons in weight. Despite the limited surveying tools of the time, it is reported that no side is more than 8 inches different in length than another. Furthermore, the whole structure is perfectly oriented to the points of the compass. For about 4500 years it was the tallest building in the world. It was not surpassed until the 19th Century.   There is much speculation on exactly how this pyramid and its companions were actually constructed.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
| 2400 B.C.E. |  | [Positional notation for numbers in Mesopotamia Around 2400 B.C.E. the Sumerians developed the sexagesimal system. This is a positional number system based on sixty, rather than ten. The Sumerians represented the integers using cuneiform wedge patterns. Their writing material consisted of a stylus and a tablet of soft clay which, when completed, was allowed to harden into a permanent document. They used a vertical wedge to represent a unit and a sidewys wedge to represent ten units. With arrangements of these two symbols they could represnt numbers of any size. Numbers between 1 and 59 were the symbols for 1 and 10 tightly grouped together. When these "digits" were to multiply powers of 60, they were separated by more space. If the Sumerians wanted to represent our number 10,884, they would put three closely spaced vertical wedges followed by a space and then one vertical wedge followed by a space and finally two sideways wedges and four vertical wedges closely spaced to each other. This represented 3(602) + 1(60) + 24 (using our notation).](http://www.math.wichita.edu/%7Erichardson/timeline.html) | 2400 B.C.E. |  | Sumerian-Akkadian Empire |
| 1850 B.C.E. |  | [Moscow Papyrus: arithmeticThe Moscow Papyrus is located in the Museum of Fine Arts in Moscow whence its name. This papyrus was copied by an unknown scribe (around 1850 B.C.E.). It was brought to Russia during the middle of the 19th century. It contains contains 25 mathematics problems involving simple “equations” and solutions. Of course the equations are not in modern form. The problem that generates the most interest is the calculation of the volume of a truncated pyramid (a square based pyramid with the top portion removed). The Egyptians seemed to know the formula for this even though this is a difficult formula to derive.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 1800 B.C.E. |  | Code of Hammurabi |
|  |  |  | 1700 B.C.E. |  | Stonehenge in England |
| 1650 B.C.E. |  | [Rhind PapyrusThe Rhind Papyrus (AKA the Ahmes Papyrus) is named after the Scottish collector, Henry Rhind, who acquired it in 1858. It evidently was a copy of a copy. It was copied by a scribe, Ahmes (around 1650 B.C.E.) who claimed it was obtained from another document written about 2000 B.C.E. This document was possibly copied from another document dating to around 2650 B.C.E. The Rhind Papyrus is located in the British Museum. This document is one of the primary sources of early Egyptian mathematics. It contains over 80 problems and solutions as well as a table of decomposition of fractions of the form 2/n.  Ahmes may well be the earliest “named” person in the history of mathematics.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 1400 B.C.E. |  | [Catastrophe in Crete-fall of the Minoan Civilization Catastrophe in Crete (Three dates are reported: 1380, 1450, 1628 B.C.E.)  Around 1400 B.C.E., a natural catastrophe occurred in the area around Crete which, according to the famous Greek archaeologist Spyridon Marinatos, eventually led to the collapse of the mighty Minoan civilization. Modern geological research has proved this theory to be correct. The catastrophe was the eruption, and resulting tsunamis, of the Satorini Volcano (also known as Thera) in the Aegean Sea. This eruption is considered to be one of the largest in the last 10,000 years and is the probable cause of the end of the Minoan civilization. (Legend has it that this Minoan civilization is the lost civilization of Atlantis!)](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
|  |  |  | 1350 B.C.E. |  | Use of iron: sundials: water clocks |
|  |  |  | 1200 B.C.E. |  | Trojan war |
|  |  |  | 776 B.C.E. |  | First Olympiad |
|  |  |  | 753 B.C.E. |  | [Founding of RomeThe Founding of Rome is very much embroiled in the myth involving Romulus and Remus and Aeneas. It appears that rather than contradict each other, the tale of Aeneas adds to that of Romulus and Remus. Archaeological evidence shows that early settlement of the Palatine Hill dates back to about 750 B.C.E. This agrees very closely to the established legend that Rome was founded on 21 April 753 B.C.E. This date has been traditionally celebrated in Rome with the festival of Parilia.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
|  |  |  | 740 B.C.E. |  | Works of Homer and Hesoid |
|  |  |  | 586 B.C.E. |  | Babylonia captivity |
| 585 B.C.E. |  | [Thales of Miletus – deductive geometryThales of Miletus (624 – 547 B.C.E.)  Thales seems to be the first known Greek mathematician and philosopher. He is often referred to as one of the Seven Sages of antiquity. He is also credited by some historians with being the “Father of deductive geometry.” Thales is usually credited with five theorems of elementary geometry:  A circle is bisected by any diameter.   The base angles of an isosceles triangle are equal.   The angles between two intersecting straight lines are equal.   Two triangles are congruent if they have two angles and one side equal.   An angle in a semicircle is a right angle.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 518 B.C.E. |  | [Pythagorean arithmetic and geometryPythagoras of Samos (569 – 475 B.C.E.)  Around 518 B.C.E. Pythagoras founded a philosophical and religious school in Croton (now Crotone, in southern Italy) that had many followers. (Pythagoras had started an earlier school in Samos which he abandoned.) Pythagoras was the leader of a Society (Brotherhood) which included an inner circle of followers known as mathematikoi. The mathematikoi lived permanently with the Society, had no personal possessions and were vegetarians. They were taught by Pythagoras himself and obeyed strict rules set down by Pythagoras. All knowledge and discoveries were attributed to Pythagoras. The rule that probably had the most impact on the history of mathematics was that all members of the brotherhood should observe strict loyalty to Pythagoras and the brotherhood and maintain secrecy. All of what we know of Pythagoras and his followers come from commentators who lived a hundred years of more later, since it appears that all knowledge and information was passed on orally.   What has become evident is that Pythagoras and his followers were considered to be, among other things, pure mathematicians. Much of the early Greek arithmetic and geometry can be traced back to the Pythagoreans.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 538 B.C.E. |  | [Persians took BabylonIn 538 B.C.E. (some historians claim 539 B.C.E.), the Persians, under the leadership of King Cyrus, took Babylon, the ancient capital of a middle eastern empire covering modern Iraq, Syria, Lebanon, and Israel, and thus became masters of Western Asia. A remarkable aspect of the capture of Babylon is the fact that Cyrus allowed the Jews (who were exiled in Babylonia) to return home. This empire lasted for over two centuries until it was divided by the successors of Alexander the Great.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
|  |  |  | 480 B.C.E. |  | Battle of Thermopylae |
|  |  |  | 461 B.C.E. |  | Beginning of the Age of Pericles |
| 450 B.C.E. |  | [Parmenides' spherical earthParmenides of Elia (ca. 515 - about 450 B.C.E.)  Parmenides was Greek philosopher who was a follower of Pythagoras. He was an early believer of a cosmology that consisted of a spherical earth and a finite, motionless, spherical universe.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 430 B.C.E. |  | [Death of ZenoZeno of Elea (ca. 490 – ca 430 B.C.E.)  Zeno was an Eleatic philosopher and was a favorite disciple of Parmenides. Philosophers of his time considered his philosophy to be quite negative. Zeno wrote a book that reportedly contained forty paradoxes concerning the continuum. Four of the paradoxes were to have a significant impact on the development of mathematics. An interesting discussion of these can be found at   http://plato.stanford.edu/entries/paradox-zeno/](http://www.math.wichita.edu/%7Erichardson/timeline.html) : [*Elements* of Hippocrates of ChiosHippocrates of Chios (470 – 410 B.C.E.)  Hippocrates of Chios was an excellent geometer who taught in Athens. He worked on the problems of squaring the circle and duplicating the cube. While working on the problem of squaring the circle, he was able to find the areas of lunes. An interesting account of his quadrature (squaring) of the lune can be found in  *Journey Through Genius: The Great Theorems of Mathematics* by William Dunham   Hippocrates was the first to write an *Elements of Geometry* and although his work is no longer extant it has been reported by later Greek writers to have contained much of what Euclid included in his first two books of the Elements, which appeared about 120 years later.](http://www.math.wichita.edu/%7Erichardson/timeline.html) | 430 B.C.E. |  | [Hippocrates of Cos (the Physician) Hippocrates of Cos (460 – 357 B.C.E.)  Hippocrates of Cos is known to us as the Father of Western Medicine and he is credited with originating the Hippocratic Oath that all doctors take upon completing their studies. The modern oath is quite close to the original.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
|  |  |  | 429 B.C.E. |  | [Death of PericlesPERICLES (495?-429 B.C .E)  Under the leadership of the statesman Pericles, Greece reached the height of its glory in the 5th century BCE. Pericles was born to a family of wealth and position. Among his accomplishments was to bring the ordinary citizen into the Athenian democracy. He was a gifted orator as was documented by the historian Thycidides. Pericles was credited with creating the mighty Athenian empire. The fear of the power of this empire by Sparta lead to the Peloponnesian War and while Athens was besieged by the enemy outside the walls, a terrible plague raged within. All these troubles caused Pericles to lose his popular support and he was deposed from office; however, a few weeks later the people repented and he was reinstated with greater powers than before. He finally died from the after effects of the plague.](http://www.math.wichita.edu/%7Erichardson/timeline.html): [The plague at AthensTHE PLAGUE IN ATHENS DURING THE PELOPONNESIAN WAR  The plague in Athens was caused by the war strategy of Pericles. His strategy was to bring all citizens from the surrounding area into Athens and let the Spartans have control of the outlying area. He planned on having Athens supplied with essential food and necessities by the navy. However, he did not count on the overcrowding in the city causing a disastrous plague.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
| 427 B.C.E. |  | Birth of Plato |  |  |  |
| 420 B.C.E. |  | [Quadratrix (Trisectrix) of HippiasHippias of Elis (460 B.C.E. - 400 B.C.E. dates are approximates)  Hippias was knowledgeable in many areas. His major contribution to mathematics was the quadratrix (also called the trisectrix) which he reportedly used for trisecting an angle and squaring the circle. The curve may be used for dividing an angle into any number of equal parts. It appears that this was the first curve in in mathematics that was not either a straight line or part of a circle. A definition and graph of this curve can be found in the book *A History of Pi* by Petr Beckmann.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 404 B.C.E. |  | [End of Peloponnesian WarThe Peloponnesian War (431 – 404 B.C.E.)   This was a war between Athens and the Athenian empire versus Sparta, Thebes, Corinth, and other members of the Peloponnesian Confederacy. This war involved heavy fighting from Sicily to the coast of Asia Minor and from the Hellespont and Thrace to Rhodes. It was the first war in history to be recorded by an eyewitness historian, Thycidides. According to Thycidides the cause of the war was Sparta's fear of the growth of the power of Athens.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
|  |  |  | 399 B.C.E. |  | [Death of SocratesSocrates (469-399 B.C.E.)   Socrates set the standard for all Western philosophy. Like the mathematician Pythagoras, Socrates left no literary legacy of his own. All we know of Socrates comes from others writing about his life and work. In his early years Socrates showed a great deal of interest in science, but he abandoned science to investigate the development of moral character. Socrates served, with distinction, as a soldier in the Peloponnesian War and after the war he worked as a stonemason. After his father's death Socrates used the money he inherited to devoting all his time to inventing the practice of philosophical dialog. In doing so he became a controversial political figure and he was charged with corrupting the youth of the city and interfering with the religion of the city. For this he was sentenced to death. Socrates drank hemlock and died in the company of his friends and disciples.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
| 360 B.C.E. |  | [Eudoxus' method of exhaustionEudoxus of Cnidos (408?--355? BCE)   Eudoxus was the first to employ the method of exhaustion in geometric proofs, a method that later geometers would return to again and again. The basic idea is structured like an indirect proof. For example, to show that region A has the same area as region B one could proceed as follows: first one shows that the assumption that Area A < Area B leads to a contradiction; next one shows that the assumption that Area A > Area B leads to a contradiction. Since neither of these is true, one is left with the fact that the only remaining possibility, Area A = Area B, must be true.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 350 B.C.E. |  | [Birth of EudemusEudemus of Rhodes (350 B.C.E. - 290 B.C.E.)  A course in the history of mathematics cannot overlook Eudemus of Rhodes for he seems to have been the first major historian of mathematics. Eudemus was not considered to be a producer of original mathematics; however, he did write an original mathematical work called *On the Angle*. This work is lost so we are unable to judge its importance but most historians consider it to be less important than his contributions to the recording of the history of mathematics.   There were three works on the history of mathematics by Eudemus; namely, *History of Arithmetic*, *History of Geometry*, and *History of Astronomy*.  *The History of Geometry* is considered the most important of the three mathematical histories of Eudemus. Even though the work is not extant, it was available to many later writers who made cited it heavily.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 332 B.C.E. |  | [Alexandria foundedThe city of Alexandria was the dream of Alexander the Great. He wanted to create a cosmopolitan city that would be a center of commerce, culture and knowledge. Alexander died before he could see the end result. However, under the rule of the Ptolemys, Alexandria flourished and became the city of Alexander's dreams. The Museum and Library drew scholars from all over the known world. Almost every major mathematician of the period spent time in Alexandria. Those who didn't spend time there likely corresponded with the scholars who were there.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 323 B.C.E. |  | [Death of AlexanderAlexander the Great (356 - 323 B.C.E.)  Alexander's parents wanted the best for their son, so they employed some of the finest scholars around to educate him. When Alexander was thirteen, he was tutored by the great Greek philosopher, Aristotle. From him he learned the ways of the Greeks which influenced his life from that point on. Alexander had great character and values and these were two of the things that made Alexander the Great a prominent individual in history. Another being that he was a great military leader that allowed him to conquer a very vast amount of territory in a relatively short amount of time.   Alexander died of mysterious causes and with no successor named on his death bed, his empire went out to generals and officers who would then become governors of sections of his empire. It was not long after that that Alexander the Great's fractured empire crumbled.   It was one of Alexander's desires that a great cosmopolitan city be built, and thus Alexandria came into existence.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
|  |  |  | 322 B.C.E. |  | Death of Aristotle |
|  |  |  | 305 B.C.E. |  | [Ptolemy I (Soter) of EgyptPtolemy I Soter (c.367- 283 B.C.E.)  Ptolemy I Soter was King of Egypt from 305 until 285 B.C.E. and founder of the Ptolemaic dynasty. He was responsible for much of the greatness of Alexandria, even though much of the work was completed by his son, Ptolemy II. It was Ptolemy I who began the construction of the Pharos Lighthouse in Alexandria, which was completed after his death. He also was responsible for the erection of the great Mouseion, Alexandria's famous ancient university. It was also Ptolemy I who created the famous Library of Alexandria, and filled it with the books that would attract great scholars to Egypt. In addition, it was Ptolemy I who was responsible for having the Hebrew Bible translated into the Greek language. Ptolemy I not only supported and encouraged the intellectual infrastructure of Alexandria, he was also a scholar himself, for he wrote a history of Alexander the Great.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
| 300 B.C.E. |  | [Euclid's *Elements*Euclid of Alexandria (ca. 325 B.C.E. - ca. 265 B.C.E.)  Little is known of Euclid of Alexandria's life except that he taught at Alexandria. He is probably the most famous mathematician of antiquity because of his being the author of the 13 books of *The Elements*. To this day there are still mathematicians who quote from *The Elements*. This must make Euclid by far the leading mathematics teacher of all time. The Elements are most often thought of in terms of geometry; however, Euclid presented material on most of the known mathematics of his time.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 280 B.C.E. |  | [Pharos, Lighthouse of AlexandriaThe Pharos (Lighthouse of Alexandria) was built around 280 B.C.E. on the ancient island of Pharos in the harbor of Alexandria, Egypt. It was approximately 400 feet high and it guided sailors for about 1500 years. It has been classified as one of the Seven Wonders of the Ancient World. It was destroyed by an earthquake in the 14th century C.E.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
|  |  |  | 264 B.C.E. |  | First Punic War |
| 260 B.C.E. |  | [Aristarchus' heliocentric astronomyAristarchus of Samos (ca. 310 B.C.E. - 230 B.C.E.)  Aristarchus was a mathematician and astronomer and is best known as the first to propose a sun-centered (heliocentric) universe. Nicolaus Copernicus, in the mid 15th century, revived and acknowledged Aristarchus's heliocentric concept. Aristarchus also gave his calculations for the sizes and distances of the sun and moon.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 230 B.C.E. |  | [Sieve of EratosthenesEratosthenes of Cyrene (276 B.C.E. - 194 B.C.E.)  In about 240 B.C.E., Eratosthenes became the third librarian at Alexandria. Although Eratosthenes was very knowledgeable in many areas, he was not considered to be the top scholar in any one field. Some claim he earned a nickname of “Beta” for this distinction—meaning that he was second best in all fields. One of the areas that Eratosthenes worked in was number theory, in particular the study of prime numbers. He is well-known for his prime number sieve, the “Sieve of Eratosthenes” which is still an important tool in number theory research. With this sieve it is possible to sift the prime numbers out of the set of positive integers with minimal computations.   Eratosthenes is credited with having made a surprisingly accurate measurement of the circumference of the Earth. An interesting point to ponder is that when Columbus decided to sail West to reach India he supposedly thought that the circumference of the Earth was about 17,000 miles—about 7,000 miles short of the actual value. Would he have ventured out in his three little boats if he had a more accurate value for the circumference of the Earth?](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 225 B.C.E. |  | [Conics of ApolloniusApollonius of Perga (262 B.C.E. - 190 B.C.E.)  Apollonius of Perga was given the nickname “The Great Geometer”. He is most remembered for his book *Conics* (about the conic sections, curves that are created by slicing through a double cone with a plane), in which he introduced the terms parabola, ellipse and hyperbola. The Greek studies of conics are all the more remarkable when one realizes that they did not have the advantages of a coordinate system nor the tools of algebra that we use today.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 212 B.C.E. |  | [Death of ArchimedesArchimedes of Syracuse (287 B.C.E. - 212 B.C.E.)  Archimedes is considered to be one of the all-time great mathematicians and inventors. Even though he resided in Syracuse, Sicily, he is considered to be an Alexandrian scholar. He corresponded with many of the scholars in Alexandria.  There are many references to Archimedes in the writings of the time. This was remarkable since his reputation was not gained after the fact, which was most common for that time period. Much of his reputation came about from his inventions. At the end of his life Syracuse was under siege by the Romans under the leadership of Marcellus. Archimedes had invented many machines which were used as engines of war that frustrated the attacking Romans.  Although Archimedes gained great fame from his mechanical inventions, he believed that pure mathematics was the only worthy pursuit. In fact, he believed that a result was not truly established until a geometric proof was supplied. Archimedes would devise a solution to a problem and then transform it into a geometrical solution.  Archimedes was killed by a Roman soldier when the Romans finally succeeded in gaining access to the city of Syracuse after many years of frustration. Plutarch (a Greek historian) gave three different accounts of the death of Archimedes. All seem to indicate that he was busy with mathematical pursuits.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 210 B.C.E. |  | [Great Wall of China begunThe Great Wall was originally built as a defensive fortification by the three states: Yan, Zhao and Qin. The Great Wall actually began as independent walls for different states when it was first built. It did not become the "Great Wall” until the Qin Dynasty. Emperor Qin Shihuang succeeded in his effort to have the walls joined together to fend off the invasions from the Huns in the north after the unification of China. The wall is approximately 4200 miles long and some sections are in ruins and some parts have totally disappeared. However, it is still observable by astronauts in space.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
| 180 B.C.E. |  | 360 degree circle |  |  |  |
|  |  |  | 146 B.C.E. |  | Destruction of Carthage |
| 140 B.C.E. |  | [Trigonometry of HipparchusHipparchus of Rhodes (190 B.C.E. - 120 B.C.E.)  Although Hipparchus was a mathematician and astronomer of major importance, we have very few definite details of his work. The majority of the information which we have about the work of Hipparchus comes from Ptolemy's Almagest. Hipparchus was one of the few Greek mathematicians to develop the mathematics leading to what we now call trigonometry. He made many valuable contributions in this area that were made use of by astronomers, like Ptolemy.   His early contribution to trigonometry was the creation of a table of chords. This table would be considered as an early example of a trigonometric table (something that those studying trigonometry after the advent of the calculator may not be familiar with). Mathematical historians often say that trigonometry was invented by him. The purpose of this table of chords was to give a method for solving triangles in a faster way than the traditional methods. Hipparchus is also credited with introducing the division of a circle into 360 degrees into Greek mathematics.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 75 B.C.E. |  | [Cicero restored tomb of ArchimedesArchimedes' tomb was inscribed, according to his wishes, with his favorite geometric theorem concerning the relationship between a sphere and its circumscribed cylinder. The location of the tomb was lost in the ensuing years; however, in 75 B.C.E. Cicero discovered the forgotten and neglected tomb and he restored the burial site of Archimedes.](http://www.math.wichita.edu/%7Erichardson/timeline.html) | . |  |  |
|  |  |  | 44 B.C.E. |  | Death of Julius Caesar |
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| 60 C.E. |  | [Geminus on the parallel postulateGeminus (10 B.C.E. - 60 C.E.)  Geminus's mathematics text Theory of Mathematics is now lost but information about it is available from a number of sources. Proclus, Eutocius and Heron all cite this work. Proclus relies very heavily on the work of Geminus when he writes his own history of mathematics and it appears that Geminus' books are the most valuable sources available to him.   Geminus is one of the early critics of the postulates of Euclid. In his work he redefines parallel lines and gives an ingenious but false proof for the parallel postulate. It is the earliest known attempt to proving the Fifth Postulate as a Theorem. His fallacy was that he he assumed that the locus of points at a fixed distance from a straight line is itself a straight line and this cannot be proved without a further postulate.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 75 C.E. |  | Works of Heron of Alexandria |  |  |  |
| 100 C.E. |  | Menelaus' *Spherica* |  |  |  |
|  |  |  | 122 C.E. |  | [Hadrian's Wall in Britain begunThe first invasion of Britain by Rome occurred in 55 B.C.E. at the time of Julus Ceasar. At the time, the British Isles, like much of mainland Europe was inhabited by many Celtic tribes loosely united by a similar language and culture but not united in the political sense. Over the years the Romans gained control over the southern portion of the British Isles; namely, what is now England and Wales. However the north remained under the control of what the Romans considered “the barbarians.” In 117 C.E. Hadrian became Emperor and at this time the Roman Empire had ceased to expand. Hadrian was concerned with maintaining his boundaries. He visited Britain in 122 C.E., and ordered a wall to be built between the Solway Firth in the West and the River Tyne in the east "to separate Romans from Barbarians".](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
| 150 C.E. |  | [Ptolemy's *Almagest*Claudius Ptolemy (85 C.E. - 165 C.E.)   Claudius Ptolemy's name is a mix of cultures. His first name "Claudius" indicates that he was a Roman citizen, whereas "Ptolemy" was the name of the Greek kings of Egypt, originally installed by Alexander the Great. Ptolemy put together a work he called simply *Mathematical Compilation*. This was an encyclopedia of everything that was known at the time about astronomy. Some was original work by Ptolemy and some was collected from other sources. It gave a means of calculating the movements of the planets and was surprisingly accurate considering Ptolemy used the Earth as the center of the universe. When the Arabs found this work they called it *Almagest*, meaning “the greatest.” Until the work of Copernicus in 1542, *Almagest* was the primary source of astronomical knowledge.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 180 C.E. |  | Death of Marcus Aurelius |
| 250 C.E. |  | [Diophantus' *Arithmetica*Diophantus of Alexandria (ca. 200 C.E. – ca. 284 C.E.)  Diophantus, is often referred to, falsely, as the “father of algebra” and is best known for his *Arithmetica*, which contains solutions of algebraic equations and material on the theory of numbers. *Arithmetica* contains a collection of indeterminate problems which mathematicians have named “Diophantine equations,” in his honor. It was a Latin translation of this book by Bachet in 1621 that is most famous. Fermat used this edition and his study of the material gave rise to the famous Fermat's Last Theorem.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 320 C.E. |  | Pappus' *Mathematical Collections* |  |  |  |
|  |  |  | 324 C.E. |  | Founding of Constantinople |
| 405 C.E. |  | [Death of Theon of AlexandriaTheon of Alexandria (ca. 335 C.E. - 405 C.E.)  Theon of Alexandria worked in Alexandria as a teacher of mathematics and astronomy. Probably his most notable work was the writing of an important edition of Euclid's Elements, which is probably the version that most modern writings on the Elements is based. Theon was the father of Hypatia, considered to be the first female mathematician of note.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 415 C.E. |  | [Death of HypatiaHypatia of Alexandria (370 C.E. - 415 C.E.)  Hypatia of Alexandria is considered to be the first woman to make any substantial contributions to the development of mathematics. She was the daughter of Theon of Alexandria, who was a mathematician and philosopher. In about 400 C.E. she became head of the Platonist school at Alexandria where she lectured on mathematics and philosophy. Although there is no evidence that she wrote any original mathematics, Hypatia helped her father write a new version of the *Elements* of Euclid and she assisted him in his eleven part commentary on Ptolemy's *Almagest*. She was quite proficient in mathematics and astronomy. Hypatia was murdered in 415 C.E. by Christians who felt threatened by her scholarship, learning, and depth of scientific knowledge.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 455 C.E. |  | Vandals sack Rome |
|  |  |  | 476 C.E. |  | Traditional “fall” of Rome |
| 524 C.E. |  | [Death of BoethiusAnicius Manlius Severinus Boethius (480 – 524 C.E.)  Boethius is considered to be one of the foremost scholars of the Dark Ages. Education and knowledge were important to Boethius and he is credited with writing the material for the quadrivium, an educational course (originally taught in monasteries) consisting of four topics: arithmetic, geometry, astronomy, and the theory of music. Although his mathematical background was very limited his fluency in Greek allowed him to translate portions of Euclid's Elements and write a book on arithmetic. These books were of poor quality but they were all that were available at the time.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 529 C.E. |  | [Closing of the schools at AthensThe Platonic Academy at Athens had been in existence for over 900 years. During the time of Proclus (410 C.E. - 485 C.E.) it had become the center of Neoplatonic learning. When Justinian became emperor in the East (the Byzantine Empire), in 527 C.E., he felt the schools' teachings were a threat to orthodox Christianity and in 529 had the schools closed and the scholars dispersed.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 530 C.E. |  | [Eutocius' commentaries on ArchimedesEutocius of Ascalon (ca. 480 C.E. - 540 C.E.)  Eutocius wrote commentaries on three works of Archimedes. It is believed that the first of Eutocius's commentaries on Archimedes was written around 510. His most famous is probably his commentary on Archimedes' *On the Sphere and Cylinder*.  Eutocius also edited and wrote commentaries on the first four books of the Conics of Apollonius.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 641 C.E. |  | [Library at Alexandria burnedAt its peak, the Library of Alexandria was reported to contain over 500,000 volumes. These volumes were collected in an unusual way. By a decree of Ptolemy III, all visitors to the city were required to surrender all books and scrolls in their possession; these writings were then copied by royal scribes. The originals were kept and put into the Library, and the copies were then given to the previous owners.   The Library of Alexandria is surrounded by a variety of contradictions concerning its destruction. When Julius Caesar torched the fleet of Cleopatra's brother and rival monarch during his invasion of Alexandria in 47–48 B.C.E. some claim that the resulting fire destroyed the Library; however, it is more often reported that a warehouse near the fleet which contained about 40,000 volumes was burned. Several other destructions have been reported with the final one being a burning in 641 C.E. supposedly at the hands of Muslim invaders. Since the Library most likely consisted of more than one building, it is possible that when any one of the buildings was destroyed it could have been called the destruction of the Library.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 732 C.E. |  | [Battle of ToursThe Battle of Tours: 732  After the conquest of Syria, Egypt, and North Africa, a Moslem army began to invade Western Europe with the goal of crushing Christianity. Abd-er Rahman led an army numbering between 60,000 and 400,000 soldiers across the Western Pyrenees. They were met outside of Tours by the Frankish Army led by Charles Martel. Even though the Moslem army had a vast cavalry and the Frankish Army was on foot, the terrain did not favor the horsemen and foot soldiers prevailed.  October 10, 732 C.E. marks the conclusion of the Battle of Tours. The battle ended with the death of Abd-er Rahman. Martel expected the Moslems to regroup and attack but they merely withdrew with the loss of their leader. This was probably one of the most decisive battles in all of history.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
| 775 C.E. |  | [Hindu works translated into ArabicMuslims have made immense contributions to almost all branches of the sciences, but mathematics appeared to be their favorite subject. Although much original mathematics is attributed to the Arabs, they obtained much by “inheritance.” The mathematical knowledge Arabs inherited came from two basic sources--the Hindus and the Greeks. The Greek works came mostly from Alexandria and the Hindu works were translated during the 8th Century C.E.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 814 C.E. |  | [Death of CharlemagneCharlemagne (c. 747 – 814)  Considered the founder of the Frankish Empire in Western Europe, Charlemagne was the elder son of Pepin the Short. Charlemagne was engaged in almost constant battle throughout his reign. He proceeded to force Catholicism on the conquered, and those who refused to convert were slaughtered.   On a more positive note, Charlemagne took a serious effort in his and others' scholarship and had learned to read in his adulthood. This was quite an achievement for kings at this time, since most were illiterate. He gave Alcuin of York (c 735-804) the task of establishing schools throughout his realm. He also made an effort to establish formal culture. His palace school at Aachen was a center of studies and the arts.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
| 830 C.E. |  | [Al-Khowarizmi's  *Algebra* Algebra was one of the major Arabic contributions to mathematics. It is from the Arabs that we get the name “algebra” it came from the title of a text book in the subject, Hisab al-jabr w'al muqabala, written about 830 C.E. by the astronomer and mathematician Mohammed ibn-Musa al-Khowarizmi. In addition our word "algorithm" in a corruption of al-Khowarizmi's name. Al-Khowarizmi's book became the standard for algebra and was used in Europe in the 13th Century.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 999 C.E. |  | Gebert becomes Pope Sylvester II |
|  |  |  | 1066 C.E. |  | [Battle of Hastings The Battle of Hastings in 1066 was the last time England was successfully invaded and conquered by a foreign army.](http://www.math.wichita.edu/%7Erichardson/%20) |
|  |  |  | 1096 C.E. |  | First Crusade |
| 1114 C.E. |  | [Birth of BhaskaraBhaskara (1114 – 1185) Indian  Bhaskara is also known as Bhaskara II or as Bhaskaracharya (meaning "Bhaskara the Teacher"). Bhaskara is considered to represent the peak of mathematical knowledge in the 12th century. He attained an understanding of the number systems and solving equations which was not to be achieved in Europe for several more centuries.   An animation of Bhaskara's dissection proof of the Pythagorean Theorem can be found at   http://www.math.wichita.edu/~richardson/  under “Things of Interest”, Pythagorean Theorem](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 1142 C.E. |  | [Adelard of Bath translated EuclidAdelard of Bath (c.1080-c.1160)  Adelard has been called the first English scientist. He wrote papers on the abacus and on the astrolabe, the most important scientific instrument of his time. In addition to translating Euclid, he translated Arabic works in mathematics and astronomy (with commentaries). These translations helped introduce Hindi-Arabic numerals and the use of zero to the west. In his book on *Natural Philosophy* he showed how reason and observation could be used to explain natural phenomena.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 1170 C.E. |  | [Murder of Thomas à BecketThomas Becket (1118 – 1170)  The life of Thomas Becket, Archbishop of Canterbury, ended with a blow from a sword on a December evening in 1170. Historians have laid the blame for the murder of Becket on his former close personal friend, King Henry II. King Henry II had appointed Becket to the top post of the Church believing that he was appointing someone he could control. However, Becket's allegiance shifted from the court to the Church.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
| 1202 C.E. |  | [Fibonacci's *Liber abaci*Leonardo Pisano Fibonacci (1170 – 1250 C.E.)  Fibonacci was born in Italy but was educated in North Africa. He traveled to North Africa with his father, who was a diplomat representing merchants of the Republic of Pisa. Fibonacci was taught mathematics by Arab tutors and from their teachings recognized the enormous advantages of the Hindu-Arabic number system and the mathematical systems developed from this number system.   Fibonacci ended his travels around the year 1200 and returned to Pisa. He then wrote a number of important texts. Of his books four have survived: *Liber abaci*, *Practica geometriae*, *Flos*, and *Liber quadratorum*. Since books in this time period were hand written and copied by hand, we are fortunate to have access to his writing in these works.   In *Liber abaci* the famous rabbit problem is found which lead to the sequence now referred to as the Fibonacci Sequence. The main thrust of *Liber abaci* was introduce Arabic arithmetic and algebra to Europe.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 1204 C.E. |  | Crusaders sack Constantinople |
|  |  |  | 1215 C.E. |  | Magna Carta |
| 1270 C.E. |  | [William of Moerbeke translated ArchimedesWilliam of Moerbeke (ca. 1215 – 1286)  William of Moerbeke was a 13th Century scholar who was the most prolific medieval translator of philosophical, medical, and scientific texts from Greek into Latin. The Vatican collection holds William's own copy of the translation he made of Archimedes' work. It is through William of Moerbeke's translations that we still have copies of Archimedes works, for many of Archimedes actual works have since been lost.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 1271 C.E. |  | Travels of Marco Polo: mechanical clocks (approx.) |
|  |  |  | 1286 C.E. |  | Invention of eyeglasses (approx.) |
| 1303 C.E. |  | [Chu Shih-Chieh and the Pascal triangle (long before Pascal)Chu Shih-Chieh (also known as Zhu Shijie) (ca.1260 – ca. 1320 C.E.)  Disclaimer: Please excuse my ignorance of the nuances of the Chinese language. I find different spellings and, to me, totally different names for people and titles of books.  The text Siyuan yujian published in 1303 contains a diagram, in Chinese symbols, of Pascal's triangle giving the binomial coefficients up to the eighth powers. This is reported to be a copy of a more ancient work. Thus the triangle we refer to as Pascal's triangle was known long before Pascal's time.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 1348 C.E. |  | [The Black DeathThe Black Death, 1348  The Black Death spread from the East and reached the shores of Italy in the spring of 1348. It unleashed a three-year rampage of death across Europe unprecedented in recorded history. In this period, anywhere from 25% to 50% of Europe's population had fallen victim.   The plague presented itself in three interrelated forms: the bubonic variant (the most common derives its name from the swellings or buboes that appeared on a victim's neck, armpits or groin); pneumonic plague (which attacked the respiratory system and was spread by merely breathing the exhaled air of a victim); and the septicemic version of the disease (which attacked the blood system.)](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
|  |  |  | 1364 C.E. |  | Death of Petrarch |
|  |  |  | 1431 C.E. |  | Joan of Arc burned |
|  |  |  | 1440 C.E. |  | [Invention of the printing pressThe invention of the printing press in 1440 C.E. was a major step forward in literacy. Prior to Johannes Gutenberg's solution to the problem of molding movable type, books were hand written and hand copied. Thus, only the very wealthy could afford to have copies of books made. The development of printing presses that could produce hundreds of books in a short period of time stimulated intellectual life. Before long it was no longer the exclusive domain of the churches and courts. The printing press helped usher in an era of enlightenment.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
|  |  |  | 1453 C.E. |  | Fall of Constantinople |
| 1464 C.E. |  | [Death of Nicolas of CusaNicholas of Cusa (1401 – 1464) Germany  Nicholas of Cusa wore many hats: Papal Vicar, Papal Legate, Cardinal, Prince-bishop, Diplomat, Lawyer, Mathematician, Astronomer, Humanist, Theologian, Philosopher, and Historian.  Giordano Bruno is said to have written:  If [Nicholas of Cusa] had not been hindered by his priest's vestment, he would have even been greater than Pythagoras!   His main interests in mathematics were in geometry and logic. This included studying the infinitely large and the infinitely small.   His interest in astronomy led him to theories which are true (and others which may still prove to be true). Unique for his time, he claimed the following: that the Earth moved round the Sun; that the stars were other suns; and that space was infinite. (He also believed that the stars had other worlds orbiting them which were inhabited.) These were rather radical theories for a priest!](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 1482 C.E. |  | [First printed edition of Euclid's *Elements*Erhard Ratdolt (1447 – 1527) German  Ratdolt produced the first printed edition of Euclid's *Elements*. It was a Latin translation by Johannes Campanus. This is acknowledged to be the first mathematical book of significance to appear in print. Prior to this, all mathematical books were hand written. This was also the first printed book illustrated with geometric figures.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 1483 C.E. |  | Murder of the princes in the Tower |
|  |  |  | 1485 C.E. |  | Henry VII, the first Tutor |
| 1489 C.E. |  | [Use of + and – by WidmannJohannes Widman (1462 – 1498)  Widman is best known for an arithmetic book he wrote in 1489 (in German) which contains the first recorded appearance of + and - signs. This book was better than those that came before it in that it had more, and a wider range, of examples. His book was reprinted until 1526. At this time Adam Ries and others wrote superior books.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 1492 C.E. |  | [Use of decimal point by PellosFrancesco Pellos (fl. 1450 – 1500)  In the year Columbus discovered America, Francesco Pellos wrote a commercial arithmetic book, Compendio de lo abaco, in which he made use of a dot to denote the division of an integer by a power of ten. This lead to the development of what we now refer to as a decimal point.](http://www.math.wichita.edu/%7Erichardson/timeline.html) | 1492 C.E. |  | Columbus discovers the Americas |
|  |  |  | 1517 C.E. |  | Protestant Reformation |
|  |  |  | 1520 C.E. |  | Field of the Cloth of Gold |
| 1527 C.E. |  | [Apian publishes the Pascal trianglePeter Apian (1495 – 1552) Germany  In 1527 Peter Apian published an arithmetic book in which the title page contained a copy of a Pascal Triangle. This is the first printed version of Pascal's Triangle and it appeared more than a century before Pascal's investigation of the properties of this triangle.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 1534 C.E. |  | [Act of SupremacyThe Act of Supremacy was English legislation that was passed in 1534. It declared that the sovereign (King of England) is Supreme Head of the Church of England.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
| 1543 C.E. |  | [Tartaglia publishes Moerbeke's translation of ArchimedesNicolo Tartaglia (1499 – 1557) Italian  Some think that Tartaglia was cheated when Cardan, after taking an oath not to do so, published Tartaglia's method of solving a cubic in his *Ars magna*. However, Tartaglia was not above passing other's work off as his own. In 1543 he published material derived from Moerbeke's translation of Archimedes as if it were his own work.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 1544 C.E. |  | [Stifel publishes *Arithmetica integra*Michael Stifel (1487 – 1567) Germany  Stifel's research emphasized arithmetic and algebra. He is credited with inventing logarithms independently of Napier using a totally different approach. In 1544 he published his most famous work, *Arithmetica integra*. This work contains binomial coefficients and the notation +, - .   Stifel also dabbled in numerology. He tried to predict the end of the world and in a most creative way assigned the number of the beast (666) to Pope Leo X.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 1545 C.E. |  | [Cardan publishes *Ars magna*Girolamo Cardano (A.K.A. Cardan) (1501 – 1576) Italian  Cardan was a man of many talents of which mathematics was one. He is best remembered for his work on solving cubic and quartic equations. Some of his work on cubic equations was obtained from Tartaglia. He took an oath that he would not publish Tartaglia's method until after Tartaglia had published. However, Cardan broke this promise when, in 1545, he published his greatest mathematical work *Ars Magna*. In it he gave the methods of solution of the cubic and quartic equation. In 1543 he discovered that Tartaglia was not the first to solve the cubic equation by radicals and as a result felt that he could publish what Tartaglia had given him despite his oath.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 1553 C.E. |  | [Servetus burned at GenevaMichael Servetus (ca. 1509 – 1553)  Michael Servetus was a Spaniard martyred in the Reformation for his criticism of the doctrine of the trinity and his opposition to infant baptism. He has the distinction of being burned at the stake by the Protestants and then a few months later he was again executed, this time in effigy, by the Catholic Inquisition in France.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
|  |  |  | 1558 C.E. |  | Accession of Elizabeth I in England |
| 1564 C.E. |  | Birth of Galileo | 1564 C.E. |  | Birth of Shakespeare and death of Michelangelo |
| 1572 C.E. |  | [Bombelli's *Algebra*Rafael Bombelli (1526 – 1572) Italy  Contrary to what many people believe, complex arithmetic did not arise from the solution of quadratic equations. The need really arose from the use of the Cardan-Tartaglia formula for the solution of a cubic equation. For example, the equation x3 = 15x + 4 has an obvious positive solution, x = 4. However, when the Cardan-Tartaglia formula is applied one gets expressions involving the square root of – 121. Bombelli is responsible for resolving this conflict by introducing the arithmetic of complex numbers. This he introduces in his work, Algebra, which gave a thorough treatment of the algebra then known as well as his important treatment of complex numbers.](http://www.math.wichita.edu/%7Erichardson/timeline.html) | 1572 C.E. |  | [Saint Bartholomew's Day Massacre (French religious war)August 24, 1572, was the date of the infamous St. Bartholomew's Day Massacre in France. At this time more than a third of the French population had adopted the Protestant faith. This raised an alarm in the Vatican. The Catholic Church was fearful of losing its power in France. The King's spiritual adviser, a Jesuit priest, urged the King to massacre the Protestants. The massacre began in Paris and spread rapidly. It is hotly debated as to whether the Pope encouraged the attack on Protestant leaders; however, the Vatican was pleased with the results and a mural depicting the Massacre was commissioned by the Pope.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
| 1579 C.E. |  | [Viète publishes *Canon mathematicus*François Viète (1540 – 1603) French  Although he was not a professional mathematician, his work deciphering cryptic messages of the enemy as a member of the king's council for Kings Henry III and IV fueled his interest in mathematics. He made significant contributions to arithmetic, algebra, trigonometry and geometry. He was a strong proponent of the decimal system and in his book *Canon Mathematicus* he made the case for using decimal fractions rather than sexagesimal fractions. (It should be noted that until this time the Babylonia system of fractions was commonly used.)](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 1584 C.E. |  | Assassination of William of Orange |
|  |  |  | 1588 C.E. |  | Drake's defeat of the Spanish armada |
| 1595 C.E. |  | [Pitiscus publishes *Trigonometria*Bartholomeo Pitiscus (1561 – 1613) Polish/German   Pitiscus is credited with coining the word “trigonometry” which appeared in the title of his 1595 book, *Trigonometria*. This work consisted of five books on plane and spherical trigonometry. After his death the work was translated into English in 1614 and French in 1619.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 1598 C.E. |  | [Edict of NantesThe Edict of Nantes of 1598 implemented the belief that the government should not prescribe religious belief and conduct. Until the Edict of Nantes, for most of the second half of the 16th Century, France was embroiled in wars of religion. (See for example, Saint Bartholomew's Day Massacre.) The two main adversaries were the Calvinist protestants and the Catholics. Both sides felt that in order to have a strong kingdom only one religion could be permitted to exist.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
|  |  |  | 1603 C.E. |  | Death of Elizabeth I |
| 1609 C.E. |  | [Kepler's *Astronomia nova*Johann Kepler (1571 – 1630) Germany  Kepler considered himself to be a mathematician who studied astronomy. With the help of the enormous number of observations made by Tyco Brahe, Kepler established the laws of planetary motion. In *Astyronomia nova* he gave his first two laws of astronomy: (1) The planets move about the Sun in elliptical orbits with the Sun at one focus. (2) The radius vector joining a planet to the Sun sweeps out equal areas in equal time.  In computing the areas in the second law, Kepler thought of the areas as being formed by a collection of infinitely small triangles with one vertex at the Sun and the other two on the orbit. He then used a form of what we would now call integral calculus to compute the areas.](http://www.math.wichita.edu/%7Erichardson/timeline.html) : Galileo's telescope |  |  |  |
| 1614 C.E. |  | [Napier's logarithmsJohn Napier (1550 – 1617) Scotland  It appears that Napier's study of mathematics was only a hobby for him and that he often found it hard to find the time for the necessary calculations between working on theology. We know him best for his invention of logarithms but he also developed an invention called "Napier's bones" used for mechanically multiplying dividing and taking square roots and cube roots.   Logarithms we use today are specified to be of a certain base; however, Napier's logarithms are not really to any base although in our present terminology we might say that they are to base 1/e. It was Henry Briggs (1561-1630), an Englishman, who improved on Napier's work and was most responsible for the acceptance of logarithms by scientists.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 1616 C.E. |  | Deaths of Shakespeare and Cervantes |
| 1620 C.E. |  | [Bürgi's logarithmsJobst Bürgi (1552 – 1632) Switzerland  Jobst Bürgi developed the idea of logarithms independently of Napier. Even though he started his investigation in 1588, about 6 years before Napier, he did not publish his results until 1620, about twelve years after Napier published his results. As a result Napier is credited with the development of logarithms and very few know the name Bürgi. If Bürgi had published before Napier, Napier would be the forgotten one since Bürgi's logarithms are very close to our natural logarithms.](http://www.math.wichita.edu/%7Erichardson/timeline.html) | 1620 C.E. |  | Landing of Pilgrims in America |
|  |  |  | 1626 C.E. |  | Death of Francis Bacon |
|  |  |  | 1628 C.E. |  | Harvey's *De motu cordis et sanguinis* |
| 1629 C.E. |  | [Fermat's method of maxima and minimaPierre de Fermat (1601 – 1665) French  We know Fermat best for his work in number theory and, of course, his famous theorem that Wiles proved in 1994. However, Fermat, even though he was not a professional mathematician, made significant contributions to the field. In 1629, while in Bordeaux, he produced important work on maxima and minima problems. His method of finding extrema was much like our current methods; however, his system of mathematical symbols made his work very awkward. He was using the system of mathematical symbols devised by François Viète.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 1636 C.E. |  | Harvard College founded |
| 1637 C.E. |  | [Descartes' *Discours de la méthode*René Descartes (1596 – 1650) French  René Descartes was a philosopher whose treatise on science under the title Discours de la méthode pour bien conduire sa raison et chercher la vérité dans les sciences contained an appendix titled La Géométrie which presents his application of algebra to geometry. This became one of the most important contributions to mathematics. For the resulting Cartesian geometry made the study of mathematics more accessible to people less skilled in formal geometry.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 1639 C.E. |  | [Desargues' *Brouillon project* Girard Desargues (1591 – 1661) French  Desargues invented a new form of geometry, projective geometry, and it was presented in a 1639 essay to be called *Brouillon project d'une atteinte aux evenemens des rencontres du Cone avec un Plan*; however, it appeared under the title Rough Draft. The end result of his work was a unified theory of conics. His work might have had a more immediate impact if it had not appeared just two years after Descartes' monumental work in geometry.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 1640 C.E. |  | [Pascal's *Essay pour les coniques*Blaise Pascal (1623 – 1662) French  Blaise Pascal had his first work, *Essay pour les coniques* (Essay on Conic Sections) published in February 1640 at the ripe old age of 17! Pascal's father Étienne Pascal did not want Blaise to study mathematics until he was 15, but at the age of 12 he discovered that the sum of the angles of a triangle are two right angles and, when his father found out, he relented and gave Blaise a copy of Euclid. Blaise Pascal was one of the great French mathematicians of the 17th, or any, Century.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 1642 C.E. |  | [Birth of Newton: Death of GalileoGalileo Galilei (1564 – 1642) Italian Sir Isaac Newton (1642 – 1727) English  Some find it coincidental that Newton was born the year that Galileo died. These two men had a great impact on our understanding of the universe. However, using the “corrected" Gregorian calendar date, Newton was born on January 4, 1643 rather than Christmas Day, 1642. The discrepancy occurs since England did not adopt the Gregorian calendar until 1752. It should be noted that the Julian calendar was switched over to the Gregorian starting in 1582, but not everyone accepted the new calendar immediately.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 1643 C.E. |  | Assassination of Louis XIV |
|  |  |  | 1644 C.E. |  | Torricelli's Barometer |
|  |  |  | 1649 C.E. |  | Charles I beheaded |
| 1655 C.E. |  | Wallis publishes *Arithmetica infinitorium* |  |  |  |
| 1658 C.E. |  | Huygens' cyclodial pendulum clock |  |  |  |
|  |  |  | 1660 C.E. |  | The Restoration |
| 1662 C.E. |  | Royal Society founded |  |  |  |
| 1666 C.E. |  | Académie des Sciences founded |  |  |  |
| 1667 C.E. |  | [Gregory's *Geometriae pars universalis*James Gregory (1638 – 1675) Scotland  In 1667 Gregory published *Geometriae pars universalis* which in reality was probably the first attempt at writing a text-book on the calculus. Gregory was a brilliant mathematician but one who was reluctant to publish his findings. His discoveries predate many of those of Newton, Taylor and Cauchy - to name just a few.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 1668 C.E. |  | Mercator publishes *Logarithmotechnia* |  |  |  |
| 1670 C.E. |  | Barrow's *Lectiones geometriae* |  |  |  |
| 1678 C.E. |  | [Ceva's TheoremGiovanni Ceva (1648 – 1734) Italy  In a time when most mathematicians were concerned with analytic geometry and calculus, the Italian mathematicians were still focusing on Euclidean geometry. The most notable contribution to Euclidean geometry during this time was Ceva's Theorem which states: A necessary and sufficient condition that lines from the vertices A, B, C of a triangle to points D, E, F on the opposite sides be concurrent is that](http://www.math.wichita.edu/%7Erichardson/timeline.html)  [(BD/DC)(CE/EA)(AF/FB)=1.](http://www.math.wichita.edu/%7Erichardson/timeline.html)  [Ceva's Theorem greatly simplified some of the proofs of major theorems in Euclidean geometry. This theorem is closely related to Menelaus' Theorem which was lost for centuries but rediscovered by Ceva and published with his theorem in 1678.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 1679 C.E. |  | [Writ of Habeas CorpusHabeas corpus in England  The procedure for the issuing of writs of habeas corpus was first codified by the Habeas Corpus Act 1679, following judicial rulings which had restricted the effectiveness of the writ. Since the 18th century the writ of habeas corpus has been used in cases of unlawful detention by private individuals. The writ of habeas corpus serves as an important check on the manner in which courts pay respect to lawful rights.   Prisoners often seek release by filing a petition for a writ of habeas corpus. A writ of habeas corpus is a judicial mandate to a prison official ordering that an inmate be brought to the court so it can be determined whether or not that person is imprisoned lawfully and whether or not he should be released from custody.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
|  |  |  | 1683 C.E. |  | Siege of Vienna |
| 1684 C.E. |  | [Leibniz' first paper on the calculus Gottfried Wilhelm von Leibniz (1646 – 1716)  In 1684 Leibniz published details of his differential calculus in *Acta Eruditorum*, a journal established in Leipzig two years earlier. The paper contained the rules for computing the derivatives of powers, products and quotients using the now the familiar *d* notation. The paper contained no proofs and was criticized for this by Jacob Bernoulli.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 1685 C.E. |  | Revocation of the Edict of Nantes |
| 1687 C.E. |  | [Newton's *Principia*Isaac Newton (1642-1727)  The actual, full title of this work is *Philosophiae Naturalis Principia Mathematica* or *The Mathematical Principles of Natural Philosophy*. It is commonly known simply as the *Principia* and it is considered to be one of the most important single works in the history of modern science. This work contains Newton's version of the calculus. Even though he began his development of the calculus before Leibniz, Newton was reluctant to publish and as a result a great controversy arose as to who should get the credit. It should be noted that the *Principia* contained much more than just Newton's calculus.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 1689 C.E. |  | The Glorious Revolution |
| 1690 C.E. |  | Rolle's *Trait d`algèbre* |  |  |  |
| 1696 C.E. |  | The Bernoulli's Brachistochrone and L'Hospital's Rule |  |  |  |
|  |  |  | 1702 C.E. |  | The start of Queen Anne's War |
| 1706 C.E. |  | [The use of the symbol π by William JonesWilliam Jones (1675 – 1749) Welsh/English  In 1706 William Jones published his *New Introduction to Mathematics* in which he introduced the symbol π. It appears he used the symbol repeatedly to denote the (periphery) circumference of a circle with unit diameter – which is π.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 1715 C.E. |  | Taylor's *Methodus incrementorium* |  |  |  |
| 1718 C.E. |  | De Moive's *Doctrine of Chances* | 1718 C.E. |  | Fahrenheit's thermometer |
| 1730 C.E. |  | Stirling's formula |  |  |  |
| 1733 C.E. |  | [Saccheri's attempt to vindicate EuclidGirolamo Saccheri (1667-1733)  Saccheri made the first serious study of the logical consequence of an actual denial of the fifth postulate. His aim was to assume the postulate false and then derive it as a logical consequence. Saccheri began by considering a quadrilateral ABCD with sides AD and BC equal and perpendicular to the base AB. Saccheri then demonstrated that the summit angles at C and D were equal. From this he then declared three hypotheses: (1) angle C = angle D > 90° (obtuse case); (2) angle C = angle D <90°(acute case); and (3) angle C = angle D = 90° (right angle case). He then proceeded to prove that if one of these hypotheses were true for one of his quadrilaterals, then it would be true for every such quadrilateral. He then showed that if the obtuse case held then the sum of the angles of a triangle would be greater than two right angles. He had little difficulty in convincing himself that this was impossible. He next attacked the acute case. Here he had great difficulty in convincing himself of the fact that this case was impossible. In fact, he came very close to discovering the first non-Euclidean geometry; however, his faith in Euclid was so strong that he denied this possibility. He eventually declared that the acute hypothesis was false leaving only the right angle hypothesis which was equivalent to the fifth postulate. Saccheri's goal was to vindicate Euclid.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 1734 C.E. |  | Berkeley's *The Analyst* |  |  |  |
|  |  |  | 1740 C.E. |  | Accession of Frederick the Great |
| 1742 C.E. |  | Maclaurin's *Treatise of Fluxions* | 1742 C.E. |  | Centigrade thermometer |
| 1748 C.E. |  | [Euler's *Introductio in analysin infinitorum*Leonhard Euler (1707 – 1783) Swiss  Leonhard Euler was probably the most prolific publisher of mathematics of all time. His research covered most all areas of mathematics known at his time. Students of mathematics today find his name in almost all courses they take. It is claimed that mathematical analysis began with Euler. In 1748 he published *Introductio in analysin infinitorum* in which he gave a more precise definition of function and made mathematical analysis the study of functions. In this work he bases the calculus on the theory of elementary functions rather than on geometric curves, as had been done previously.](http://www.math.wichita.edu/%7Erichardson/timeline.html) :  [Agnesi's *Istituzioni Analitiche*Maria Gaëtana Agnesi (1718 – 1799) Italian  Maria Gaëtana Agnesi showed remarkable talents very early in life and since her father could afford to give her high quality tutors she mastered many languages such as Latin, Greek and Hebrew at an early age. Much of her mathematics she studied on her own. She became very familiar with the works of Newton and L'Hospital. Out of this understanding came her famous book *Instituzioni Analitiche*, a book on differential calculus. She wrote the book in Italian as a teaching text and it was a significant book for studying the calculus for many years.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 1750 C.E. |  | Cramer's Rule |  |  |  |
|  |  |  | 1752 C.E. |  | Franklin's kite experiment |
|  |  |  | 1767 C.E. |  | Watt's improved steam engine |
| 1770 C.E. |  | Hyperbolic trigonometry |  |  |  |
|  |  |  | 1774 C.E. |  | Discovery of oxygen |
|  |  |  | 1776 C.E. |  | [American Declaration of IndependenceThe Declaration of Independence of the Thirteen Colonies  The Declaration of Independence could be considered a mathematical document. Thomas Jefferson was a well educated man who believed that all educated people should know mathematics at least through trigonometry. He was impressed by the formal nature of mathematics and it appears this carried over into the writing of the Declaration of Independence. In the second paragraph he proposes his axioms (“We hold these truths to be self-evident, ...”). He then states his theorem that the Colonies should withdraw from the rule of King George III. He then supplies the proof for his theorem. “To prove this, let Facts be submitted to a candid world. ... “](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
| 1777 C.E. |  | [Buffon's needle problemGeorges Louis Leclerc Comte de Buffon (1707 – 1788) French  Buffon was a well-educated man who wrote on a wide range of topics that included mathematics, the theory of probability, astronomy and physics, especially optics. His most referenced contribution to mathematics was a geometrical probability experiment. He threw sticks over his shoulder onto a tiled floor and counted the number of times the sticks fell across the lines between the tiles. His conclusion was that the the number of successes was related to the area under a cycloid whose generating circle has a diameter equal to the length of the stick.  The current problem, known as the "Buffon Needle Problem", is to drop a needle on a lined sheet of paper and determine the probability of the needle crossing one of the lines on the paper.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 1781 C.E. |  | Discovery of Uranus by Herschel |  |  |  |
| 1788 C.E. |  | Lagrange's *Mécanique analytique* |  |  |  |
|  |  |  | 1789 C.E. |  | French Revolution |
| 1794 C.E. |  | Legendre's *Elements de géométrie* | 1794 C.E. |  | [Lavoisier (father of modern chemistry) guillotined Antoine Lavoisier (1743 – 1794) French  Lavoisier originally studied law at the urgings of his family; however at age 21 he began to fulfill his dream to study mathematics and science. He studied astronomy, botany and geology under eminent scientists of the time. From 1770 to 1790 the science of chemistry was radically changed and Lavoisier was the principle mover and hence has been referred to as the Father of Modern Chemistry.  In 1768 he joined a tax collecting agency that collected taxes for the Crown. He worked for this firm in order to earn money to continue his work in chemistry. Although he discharged his duties honestly, the revolution zealots found him guilty of conspiracy against the people of France and sentenced him to die. He was guillotined on May 8, 1794.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
|  |  |  | 1795 C.E. |  | École Polytechnique and École Normale established |
| 1796 C.E. |  | Laplace's *Systeme du monde* (nebular hypothesis ) | 1796 C.E. |  | Vaccination |
| 1797 C.E. |  | Lagrange's *Fonctions analytique* |  |  |  |
|  |  |  | 1799 C.E. |  | Metric system introduced |
|  |  |  | 1800 C.E. |  | Volta's battery |
| 1801 C.E. |  | Gauss' *Disquisitiones arthmeticae* : Ceres discovered |  |  |  |
|  |  |  | 1803 C.E. |  | Dalton's atomic theory |
|  |  |  | 1804 C.E. |  | Napoleon crowned emperor |
| 1810 C.E. |  | Gergonne started the journal *Annales* |  |  |  |
|  |  |  | 1815 C.E. |  | Battle of Waterloo |
|  |  |  | 1820 C.E. |  | Oersted discovered electromagnetism |
| 1822 C.E. |  | Fourier series |  |  |  |
| 1826 C.E. |  | Crelle's Journal founded: Principle of Duality:  Elliptic functions | 1826 C.E. |  | Ampere's work in electrodynamics |
| 1827 C.E. |  | Cauchy's *Calculus of Residues* | 1827 C.E. |  | Ohm's Law |
| 1829 C.E. |  | Lobachevskian geometry: Death of Abel |  |  |  |
|  |  |  | 1831 C.E. |  | Faraday's electromagnetic induction |
| 1832 C.E. |  | Death of Galois: Babbage's Analytical Engine |  |  |  |
| 1836 C.E. |  | Liouville's Journal founded | 1836 C.E. |  | Telegraph invented |
| 1843 C.E. |  | Hamilton's quaternions |  |  |  |
|  |  |  | 1846 C.E. |  | Neptune discovered: Use of anesthesia |
|  |  |  | 1848 C.E. |  | Marx's *Communist Manifesto* |
|  |  |  | 1850 C.E. |  | Dickens' *David Copperfield* |
| 1854 C.E. |  | Boole' *Laws of Thought* |  |  |  |
|  |  |  | 1858 C.E. |  | The Atlantic cable laid |
|  |  |  | 1859 C.E. |  | Darwin's Origin of Species |
|  |  |  | 1861 C.E. |  | Start of American Civil War |
|  |  |  | 1865 C.E. |  | Assassination of Abraham Lincoln |
|  |  |  | 1868 C.E. |  | Cro-Magnon caves discovered |
|  |  |  | 1869 C.E. |  | Suez Canal finished |
| 1873 C.E. |  | Hermite proved *e* transcendental |  |  |  |
| 1874 C.E. |  | Cantor's Mengenlehre |  |  |  |
|  |  |  | 1876 C.E. |  | Alexander Bell's telephone |
| 1882 C.E. |  | Lindemann proved  π   transcendental |  |  |  |
| 1888 C.E. |  | American Mathematical Society founded | 1888 C.E. |  | Pasteur Institute founded |
| 1889 C.E. |  | Peano's postulates |  |  |  |
|  |  |  | 1895 C.E. |  | Roentgen discovered X-rays |
| 1896 C.E. |  | Prime Number Theorem proved | 1896 C.E. |  | Discovery of radioactivity |
|  |  |  | 1897 C.E. |  | Electrons discovered |
|  |  |  | 1898 C.E. |  | Radium dscovered |
| 1899 C.E. |  | [Hilbert's*Grundlagen der Geometrie*David Hilbert (1862 – 1943) Born in Prussia, died in Germany  Hilbert was one of the great mathematicians of the 19th and 20th Centuries. No person has had a greater influence on geometry since Euclid. In 1899 Hilbert, after a systematic study of the axioms of Euclidean geometry, proposed his own collection of 21 such axioms and he analyzed their significance. He then published *Grundlagen der Geometrie* which solidly put geometry in a formal axiomatic setting. The book was a major influence in promoting the axiomatic approach to mathematics which has been one of the major characteristics of the subject throughout the 20th century.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 1900 C.E. |  | [Hilbert's ProblemsDavid Hilbert (1862 – 1943) Born in Prussia, died in Germany  Hilbert was one of the great mathematicians of the 19th and 20th Centuries. He was challenged to determine the route of mathematical research in the 20th Century and at the Second International Congress of Mathematicians in Paris Hilbert delivered his famous speech “The Problems of Mathematics” which left mathematicians with 23 challenging problems. Some, but not all, of these problems have been solved to date.  In 1930 Hilbert gave an address (at his retirement) which ended with six famous words which showed his enthusiasm for mathematics and his life devoted to solving mathematical problems. “Wir müssen wissen, wir werden wissen” We must know, we shall know.](http://www.math.wichita.edu/%7Erichardson/timeline.html) : Russell and Whitehead's *Principia*, Vol.1 | 1900 C.E. |  | Freud's *Die Traumdeutung* |
| 1901 C.E. |  | Planck's quantum theory | 1901 C.E. |  | First radio receiver |
| 1903 C.E. |  | Lebesgue integration | 1903 C.E. |  | First powered air flight |
| 1905 C.E. |  | Einsteins's special relativity |  |  |  |
|  |  |  | 1906 C.E. |  | Kellogg invents cornflakes |
|  |  |  | 1908 C.E. |  | Model T Ford |
|  |  |  | 1914 C.E. |  | Assassination of Austrian Archduke Francis Ferdinand |
|  |  |  | 1915 C.E. |  | Panama Canal opened |
| 1916 C.E. |  | Einstein's general theory of relativity |  |  |  |
| 1917 C.E. |  | Hardy and Ramanujan | 1917 C.E. |  | Russian Revolution:  [The Balfour DeclarationArthur James Balfour, 1st earl of Balfour (1848–1930)  Balfour was first lord of the admiralty from 1915 to 1916 in Herbert Asquith's coalition government and in 1916 became foreign secretary under David Lloyd George. In this capacity in 1917 he issued the Balfour Declaration, pledging British support to the Zionist hope for a Jewish national home in Palestine, with the proviso that the rights of non-Jewish communities in Palestine would be respected](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
|  |  |  | 1919 C.E. |  | League of Nations |
|  |  |  | 1927 C.E. |  | Lindberg flew the Atlantic |
|  |  |  | 1928 C.E. |  | Fleming discovers penicillan |
| 1931 C.E. |  | Gödel's Theorem |  |  |  |
|  |  |  | 1932 C.E. |  | Atom split |
|  |  |  | 1933 C.E. |  | Hitler became Chancellor |
| 1936 C.E. |  | [Ahlfors and Douglas awarded the first Fields MedalsFields Medal  In 1924 at the International Congress of Mathematicians it was proposed that gold medals should be awarded to recognize outstanding mathematical achievement. It wasn't until 1936 that the first medals were awarded to Lars Valerian Ahlfors (Harvard University) and Jesse Douglas (Massachusetts Institute of Technology). The Fields Medals are awarded every four years. This award is considered to be the equivalent to the Nobel Prize (which does not exist in mathematics). An interesting restriction is that the medals would not be given to mathematicians over forty years of age!](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 1939 C.E. |  | [Volume I of Bourbaki's *Eléments*The name Nicolas Bourbaki was used to disguise a group of anonymous French mathematicians who took it upon themselves to revitalize mathematics. The story of Bourbaki is too complex to summarize briefly. The following URL gives a nice history of Bourbaki.  http://planetmath.org/encyclopedia/ NicolasBourbaki.html](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 1941 C.E. |  | Pearl Harbor |
|  |  |  | 1945 C.E. |  | Bombing of Hiroshima |
|  |  |  | 1946 C.E. |  | First meeting of the U.N. |
|  |  |  | 1950 C.E. |  | Korean War began |
|  |  |  | 1957 C.E. |  | Sputnik I launced |
|  |  |  | 1958 C.E. |  | Berlin airlift |
| 1961 C.E. |  | [Lorenz on chaotic behaviorEdward Lorenz (1917 - 2008), an American meteorologist at the Massachusetts Institute of Technology, discovered a simple mathematical system with chaotic behavior. This discovery led to the new mathematics of chaos theory which is now widely applicable.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 1963 C.E. |  | [Paul J. Cohen on the continuum hypothesisPaul J. Cohen (1934 - ), an American mathematician, proves the independence of the axiom of choice and of the continuum hypothesis. For his efforts he won the Fields Medal in 1966.](http://www.math.wichita.edu/%7Erichardson/timeline.html) | 1963 C.E. |  | Assassination of President Kennedy |
|  |  |  | 1965 C.E. |  | Death of Sir Winston Churchill |
|  |  |  | 1967 C.E. |  | [Summer of LoveThe Summer of Love was a designation for the summer of 1967. Hippies from all over the country flocked to the Haight-Ashbury district of San Francisco that summer. This is when the hippie movement came to full fruition. The Mamas and the Papas hailed this event with their song, If You Go To San Francisco, which began '"If you're going to San Francisco, / be sure to wear some flowers in your hair... “](http://www.math.wichita.edu/%7Erichardson/timeline.html) |
|  |  |  | 1969 C.E. |  | Man walks on the moon |
| 1970 C.E. |  | [Matiyasevich shows Hilbert's tenth problem is unsolvableYuri Matiyasevich (1947 - ), a Russian mathematician, showed that "Hilbert's tenth problem" was unsolvable, namely that there is no general method for determining when polynomial equations have a solution in whole numbers.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 1974 C.E. |  | President Nixon resigns |
|  |  |  | 1975 C.E. |  | End of Vietnam War |
| 1976 C.E. |  | [Four Color conjecture verified by computerKen Appel and Wolfang Haken showed that the Four Color Conjecture is true using 1200 hours of computer time to examine around 1500 configurations.   The four-color theorem states that any map in a plane can be colored using four-colors in such a way that regions sharing a common boundary (other than a single point) do not share the same color.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 1977 C.E. |  | [Adelman, Rivest and Shamir introduce public-key codesRonald Rivest, Adi Shamir, and Leonard Adleman introduce public-key codes (known as the RSA algorithm), a system for passing secret messages using large primes and a key which can be published.   Leonard Adleman (1945 - ) is a theoretical computer scientist and professor of computer science and molecular biology at the University of Southern California.  Ronald Linn Rivest (1947 - ) is a cryptographer, and is the Viterbi Professor of Computer Science at MIT's Department of Electrical Engineering and Computer Science.  Adi Shamir (1952 - ) is an Israeli cryptographer.](http://www.math.wichita.edu/%7Erichardson/timeline.html) | 1977 C.E. |  | First *Star Wars* movie released |
| 1982 C.E. |  | [Mandelbrot's *The fractal geometry of nature*Benoit Mandelbrot (1924 - ) publishes *The fractal geometry of nature*, which describes the theory of fractals. This study was largely responsible for the present interest in fractal geometry. He showed how fractals can occur in many different places in both mathematics and elsewhere in nature.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
|  |  |  | 1984 C.E. |  | Ethiopian famine |
|  |  |  | 1989 C.E. |  | Fall of Berlin Wall |
|  |  |  | 1990 C.E. |  | Nelson Mandela released from prison |
|  |  |  | 1991 C.E. |  | Soviet Union disintegrates |
| 1994 C.E. |  | [Wiles proves Fermat's Last TheoremAndrew Wiles (1953 - )  The proof of Fermat's Last Theorem was first announced in 1993 by Andrew Wiles, a British mathematician working at Princeton University. Wiles gave a series of three lectures at the Isaac Newton Institute in Cambridge, culminating with the announcement that he had proved Fermat's Last Theorem as a corollary to his main results. However, his proof was not entirely correct and it was another year before he had corrected his proof. His paper which proves Fermat's Last Theorem is *Modular elliptic curves and Fermat's Last Theorem* which appeared in the Annals of Mathematics in 1995.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |
| 2000 C.E. |  | [Mathematical Challenges of the 21st Century announcedIn an effort to duplicate Hilbert's proposed problems of 1900, a team of 30 leading mathematicians, of whom eight were Fields Medal winners, proposed "Mathematical Challenges of the 21st Century" at a meeting of the American Mathematical Society in Los Angeles.](http://www.math.wichita.edu/%7Erichardson/timeline.html) |  |  |  |