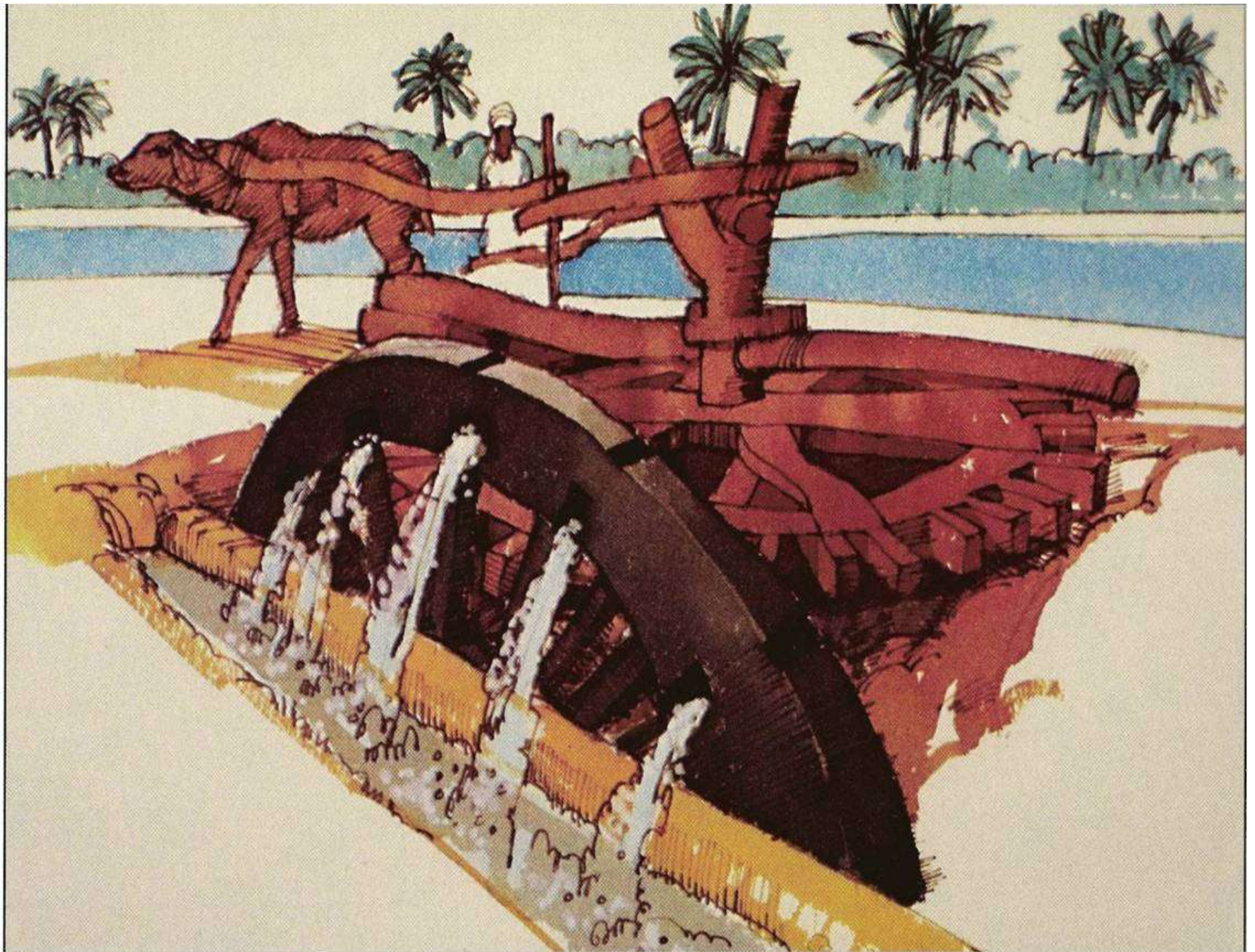




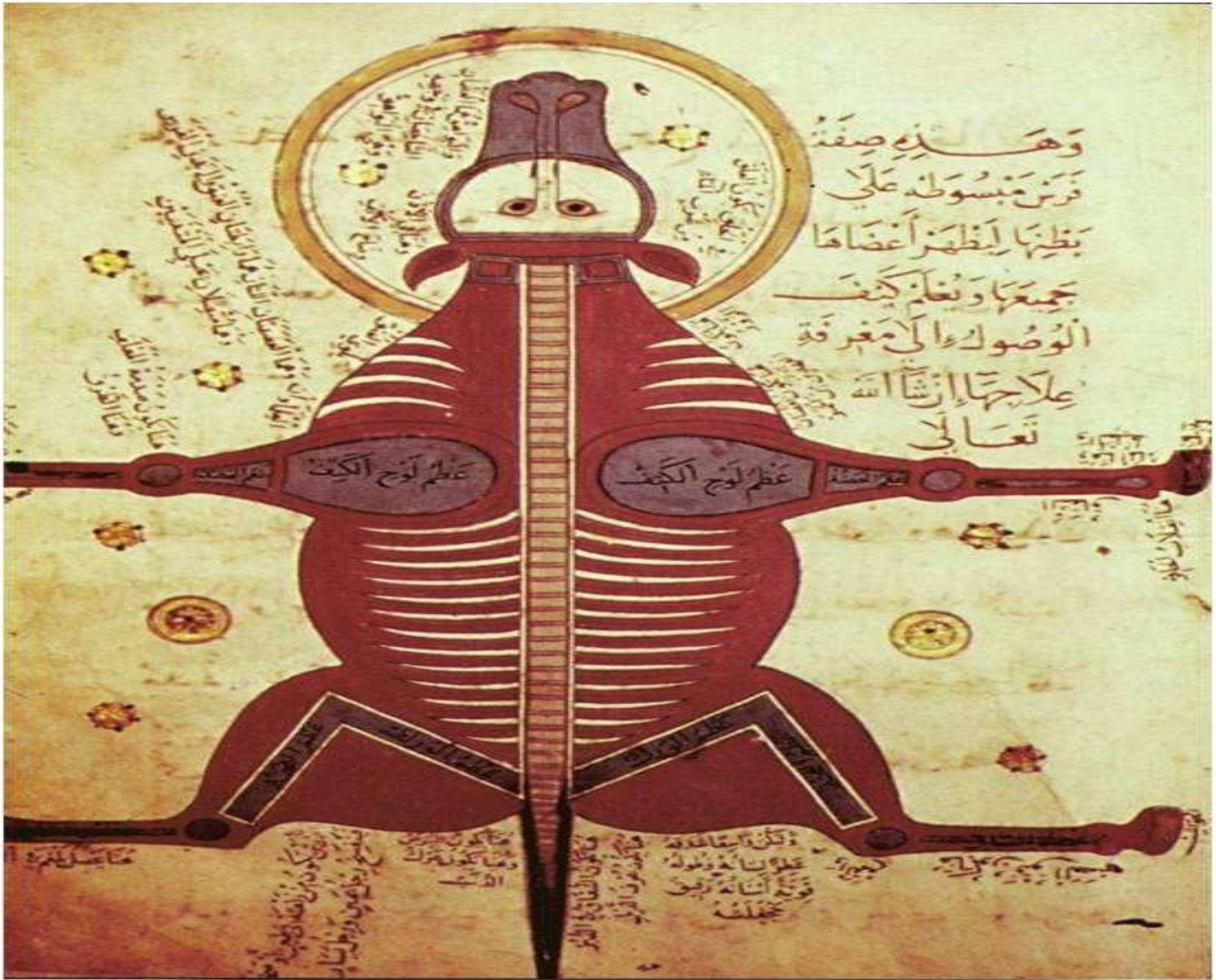
CHESS

The game of chess was introduced to the Muslim world by the Persians, who had learned it from India. The game became very popular among men and women because of its difficulty and intellectual challenges. Caliphs (rulers) would invite champions of the game to their palaces for chess tournaments. Eventually, chess was introduced to the people of Europe and then it spread throughout the rest of the world.



IRRIGATION AND UNDERGROUND WELLS

Because water was so scarce in the desert regions of the Muslim Empire, the people developed irrigation techniques and used underground wells. Dams, aqueducts, and reservoirs (a natural or man-made area where water is stored for later use) were built throughout the empire. Muslims also perfected the water wheel. Water wheels could be operated by man, animal, or the wind. Underground wells were dug as much as 50 feet deep to tap into underground water sources. Much of the agriculture of the Empire was dependent on these irrigation techniques.



ZOOLOGY

Muslim scholars made great advances in the study of zoology, the scientific study of animals. This was important because much of Muslims' lifestyle was dependent on animals for trade and travel. These scholars wrote books about how to care for and the uses of different animals. They even wrote books about medicines that could be made from animals to help humans.



BANKING SYSTEM

A banking system was developed throughout the Muslim Empire to help end the confusion caused by all the different kinds of money being used in the Empire. The word “check” comes from the Arabic word *sakk*. The Muslims established central banks in large cities with branch offices scattered throughout the Empire. This allowed for a check written in one part of the Empire to be checked in a different city in another part of the Empire. This was very helpful with the expansion of trade within the Empire and with other civilizations.

CALLIGRAPHY

Calligraphy, which means beautiful writing, is the art of elegant handwriting. It was first used when Muslims began to prepare copies of the Qur'an. The words of the Qur'an were written in calligraphy because only the most beautiful handwriting was considered worthy of the word of Allah. This made the person creating the calligraphy very important. Calligraphy was considered to be one of the highest forms of art in the Muslim culture.



GEOMETRIC AND FLORAL DESIGN

Muslim art was mostly abstract, which means that pictures did not represent realistic images of people or animals. It was believed that human images would distract worshippers from praying to Allah. Muslim artists turned to plant patterns and geometric designs as the focus of their art. The most common design was the arabesque. This was a winding stem of leaves and flowers that formed a spiraling design. The arabesque decorated everything from small objects (metal boxes, ceramic bowls, and tiles) to carpets and entire walls.

BOOKMAKING

Captured Chinese soldiers taught the Muslims how to make paper. As a result, bookmaking became popular. Books became more readily available and contributed to interest in learning of all kinds. Because calligraphy and artistic design was part of books, it became a status symbol for the rich to own books.



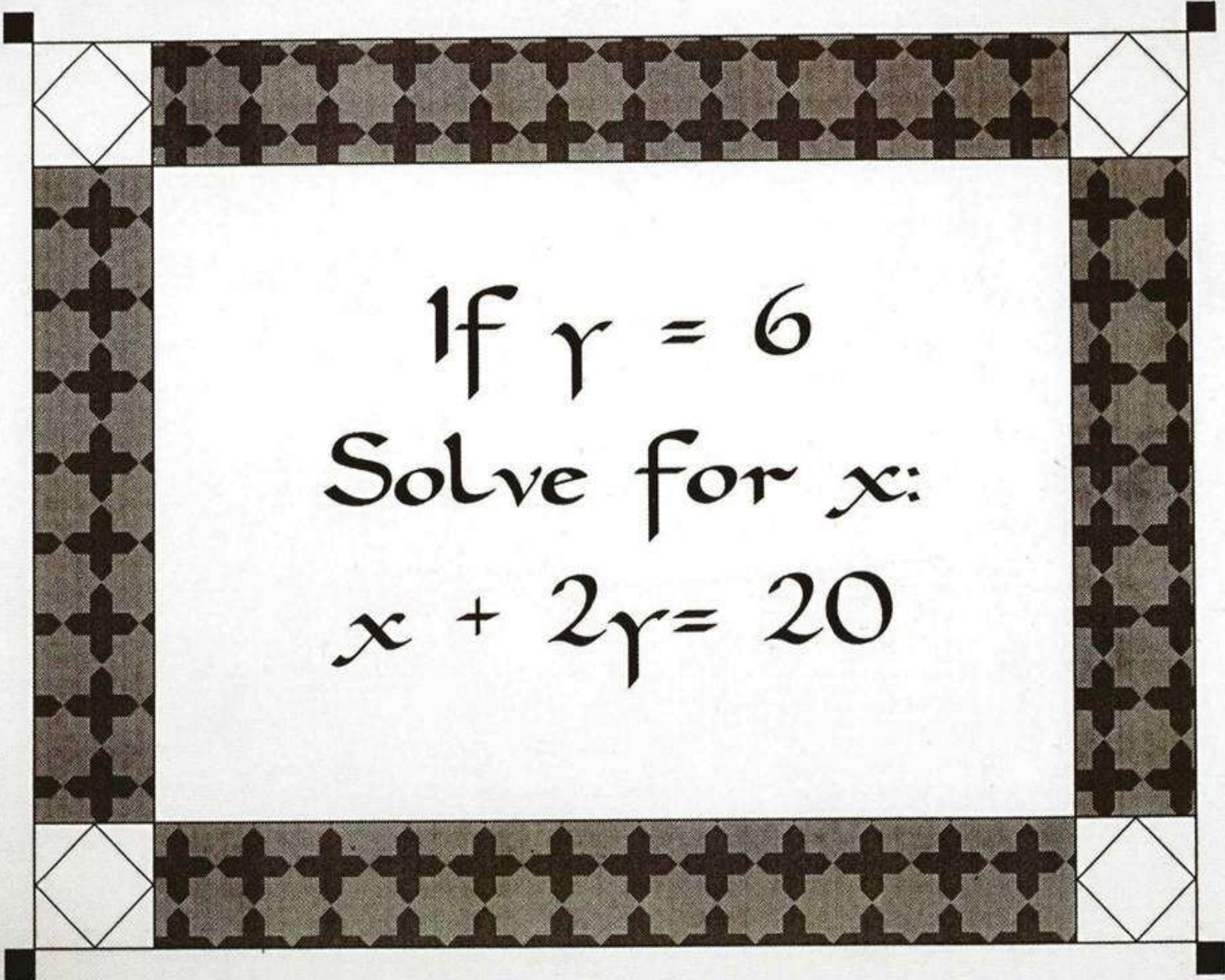
HOUSE OF WISDOM

The House of Wisdom was an educational institution where scholars translated materials about topics such as mathematics, astronomy, and logic. These scholars helped preserve (save) Greek classics in philosophy and science that may have been lost or destroyed. The House of Wisdom helped to encourage openness to new ways of thinking. The library of the House of Wisdom was open to the public. It contained copies of the Qur'an, as well as, books on law, poetry, and history.



ASTRONOMY

Astronomy, the scientific study of the sky, is an area in which Islamic scientists made great achievements. They adapted the use of the astrolabe from the Greeks. The astrolabe was a small, flat, brass disc marked off by degrees. By lining up the pointer with the Sun, the user could measure latitude, tell the time of day, and determine the position or movement of the stars and planets. Islamic scientists determined that the Earth was a sphere and that it rotated on its own axis and that the Sun, not the Earth, was the center of the universe. It would take the scientists of Western Europe several more centuries to make these same discoveries.



If $\gamma = 6$
Solve for x :
 $x + 2\gamma = 20$

ALGEBRA

Muslim scholars were very interested in furthering the developments of the ancient Greeks in the field of mathematics. They spent hours trying to “stump” each other with difficult mathematical puzzles. For fun they made “magic boxes” that were grids containing numbers that added up to the same sum horizontally, vertically, and diagonally. The science of algebra was introduced by Muslims. Algebra comes from the Arabic word “*al jabr*” which means “the bringing together of separate parts”. In algebra, symbols such as x , y , or z are substituted for numbers in order to solve mathematical problems.



HOSPITALS

An interest in treating illness can be traced back to the beginnings of Islam when Muhammad stated that Allah had provided a cure for every illness. It was in the Muslim world that hospitals were first built. Hospitals were designed to promote health, cure diseases, and teach and expand medical knowledge. By the ninth century there were hospitals in all large Muslim towns. The most advanced hospitals had laboratories, pharmacies, libraries and patient rooms with beds. Patients with contagious illnesses were put in a separate part of the hospital.



HERBAL MEDICINES AND PHARMACIES

Muslim doctors experimented with the treatment of illnesses through herbal medicines. Plants were used to stop pain during surgery and to help cleanse wounds. Muslim doctors used medical plants to design treatments for patients suffering from long term illness. In addition to making advances in herbal medicines, pharmacies were built to provide the medications needed to help heal illnesses. Pharmacies in the Muslim world filled prescriptions much like present-day drug stores do. Medicines were considered so important and dangerous that they were carefully supervised, both during preparation and in storage.



The game of polo was introduced to the Muslim world by the Persians. Polo is a ball and goal game played on horseback by two teams of four on a grass field with goals on both ends. Players use a wooden mallet to strike the ball into the goal. Because of its use of horses, the game became a favorite among wealthy Muslims. They adapted and improved the game by raising fast-moving Arabian horses. The game was later introduced to Europeans. It is now played around the world.



MUSIC OF MUSLIM SPAIN

The music of Muslim Spain is an important achievement of the Islamic world. Europe's first music school was established by a Muslim in Cordoba, Spain. The musicians developed a unique style of music that combined the styles of classic Arab and native Spanish cultures. The instruments most often used were the *oud*, a short-necked stringed instrument that is the ancestor of the guitar; a *rebab*, a Middle-Eastern instrument that resembles a violin; the *ney*, a simple wooden flute; and the *darbuka*, a goblet shaped drum made from pottery. The beginnings of many instruments can be traced back to Muslim Spain. These include: the oboe, trumpet, harp, violin, guitar, and percussion instruments.