

Day 9: Pythagorean Theorem

Math

The Pythagorean Theorem

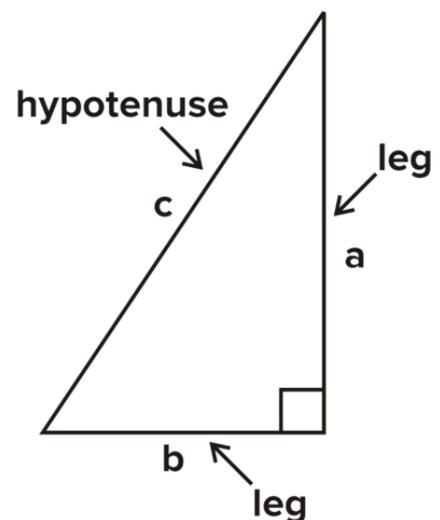
Materials:

- Calculator
- Pencil/paper

The Pythagorean theorem is a very important equation that is widely used in many aspects of the world today. We can use it to find the length of a side or to find that a corner is actually a right angle, or 90 degrees.

The equation is a simple one and one that you might have heard before. The equation is

$a^2 + b^2 = c^2$ where the letters "a" and "b" represent the legs of the triangle. These are the sides that connect to form a right angle (as shown in the picture). The hypotenuse is the side opposite the right angle and is represented by the letter "c".



To determine if a triangle is a right triangle, the equation must be true. If it is, then the triangle has a right angle.

For example, let's see if this triangle has a right angle. Here are the measurements:

$$a = 3, b = 4, c = 6$$

If we plug in the numbers into the equation, it should look like this:

$$a^2 + b^2 = c^2 \quad 3^2 + 4^2 = 6^2$$

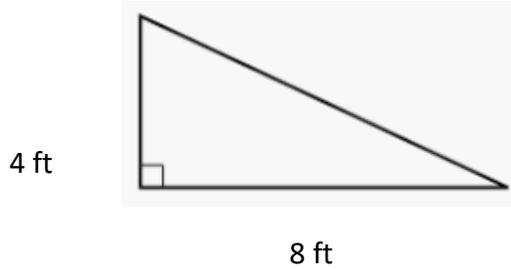
Then, square each number and solve:

$$9 + 16 = 36 \quad 25 = 36$$

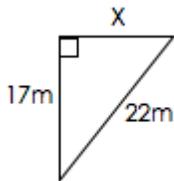
Is this a right triangle? No, it is not. 25 does **NOT** equal 36.

Now, let's try some other examples. Solve for the missing side.

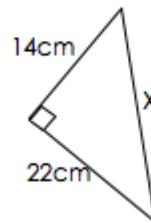
1.



2.



3.



Are the following right triangles?

4. $a = 5, b = 6, c = 7$

5. $a = 6, b = 8, c = 10$

6. $a = 11, b = 15, c = 23$

7. $a = 10, b = 20, c = 40$

8. If a truck bed is 6ft. long and 4 feet wide, what is the longest piece of wood that you could fit into the truck bed (with the tailgate up) if you put it in diagonally?

Day 9: Mars Colony Part 2

Science

Materials:

- Paper

1. Finish your research and begin to design/build your colony.
2. Design a colony (map). Create structures, a layout, and other things to help you successfully survive on the planet. Begin a draft of the written explanation.
3. How many structures will there be? How many people will be able to live there? What things will you need in your colony to survive?

Day 9: Bill of Rights, Constitution

Social Studies

- Determine what rights you would want to be guaranteed on Mars based on the current United States Constitution.
- Copy of the Bill of Rights: www.archives.gov/founding-docs/bill-of-rights-transcript
- After reviewing the 10 rights listed in the Bill of Rights, determine what modifications should be made.
- Develop any recommendations or changes to the document based on a new possible government system on a new planet.

The Bill of Rights: A Transcription

Note: The following text is a transcription of the enrolled original of the Joint Resolution of Congress proposing the Bill of Rights, which is on permanent display in the Rotunda at the National Archives Museum. The spelling and punctuation reflects the original.

On September 25, 1789, the First Congress of the United States proposed 12 amendments to the Constitution. The 1789 Joint Resolution of Congress proposing the amendments is on display in the Rotunda in the National Archives Museum. Ten of the proposed 12 amendments were ratified by three-fourths of the state legislatures on December 15, 1791. The ratified Articles (Articles 3–12) constitute the first 10 amendments of the Constitution, or the U.S. Bill of Rights. In 1992, 203 years after it was proposed, Article 2 was ratified as the 27th Amendment to the Constitution. Article 1 was never ratified.

Transcription of the 1789 Joint Resolution of Congress Proposing 12 Amendments to the U.S. Constitution

Congress of the United States begun and held at the City of New-York, on Wednesday the fourth of March, one thousand seven hundred and eighty nine.

THE Conventions of a number of the States, having at the time of their adopting the Constitution, expressed a desire, in order to prevent misconstruction or abuse of its powers, that further declaratory and restrictive clauses should be added: And as extending the ground of public confidence in the Government, will best ensure the beneficent ends of its institution.

RESOLVED by the Senate and House of Representatives of the United States of America, in Congress assembled, two thirds of both Houses concurring, that the following Articles be proposed to the Legislatures of the several States, as amendments to the Constitution of the United States, all, or

any of which Articles, when ratified by three fourths of the said Legislatures, to be valid to all intents and purposes, as part of the said Constitution; viz.

ARTICLES in addition to, and Amendment of the Constitution of the United States of America, proposed by Congress, and ratified by the Legislatures of the several States, pursuant to the fifth Article of the original Constitution.

Article the first... After the first enumeration required by the first article of the Constitution, there shall be one Representative for every thirty thousand, until the number shall amount to one hundred, after which the proportion shall be so regulated by Congress, that there shall be not less than one hundred Representatives, nor less than one Representative for every forty thousand persons, until the number of Representatives shall amount to two hundred; after which the proportion shall be so regulated by Congress, that there shall not be less than two hundred Representatives, nor more than one Representative for every fifty thousand persons.

Article the second... No law, varying the compensation for the services of the Senators and Representatives, shall take effect, until an election of Representatives shall have intervened.

Article the third... Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances.

Article the fourth... A well regulated Militia, being necessary to the security of a free State, the right of the people to keep and bear Arms, shall not be infringed.

Article the fifth... No Soldier shall, in time of peace be quartered in any house, without the consent of the Owner, nor in time of war, but in a manner to be prescribed by law.

Article the sixth... The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.

Article the seventh... No person shall be held to answer for a capital, or otherwise infamous crime, unless on a presentment or indictment of a Grand Jury, except in cases arising in the land or naval forces, or in the Militia, when in actual service in time of War or public danger; nor shall any person be subject for the same offence to be twice put in jeopardy of life or limb; nor shall be compelled in any criminal case to be a witness against himself, nor be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use, without just compensation.

Article the eighth... In all criminal prosecutions, the accused shall enjoy the right to a speedy and public trial, by an impartial jury of the State and district wherein the crime shall have been committed, which district shall have been previously ascertained by law, and to be informed of the nature and cause of the accusation; to be confronted with the witnesses against him; to have compulsory process for obtaining witnesses in his favor, and to have the Assistance of Counsel for his defence.

Article the ninth... In suits at common law, where the value in controversy shall exceed twenty dollars, the right of trial by jury shall be preserved, and no fact tried by a jury, shall be otherwise re-examined in any Court of the United States, than according to the rules of the common law.

Article the tenth... Excessive bail shall not be required, nor excessive fines imposed, nor cruel and unusual punishments inflicted.

Article the eleventh... The enumeration in the Constitution, of certain rights, shall not be construed to deny or disparage others retained by the people.

Article the twelfth... The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people.

ATTEST,

Frederick Augustus Muhlenberg, Speaker of the House of Representatives
John Adams, Vice-President of the United States, and President of the Senate
John Beckley, Clerk of the House of Representatives.
Sam. A Otis Secretary of the Senate

The U.S. Bill of Rights

The Preamble to The Bill of Rights

Congress of the United States

begun and held at the City of New-York, on
Wednesday the fourth of March, one thousand seven hundred and eighty nine.

THE Conventions of a number of the States, having at the time of their adopting the Constitution, expressed a desire, in order to prevent misconstruction or abuse of its powers, that further declaratory and restrictive clauses should be added: And as extending the ground of public confidence in the Government, will best ensure the beneficent ends of its institution.

RESOLVED by the Senate and House of Representatives of the United States of America, in Congress assembled, two thirds of both Houses concurring, that the following Articles be proposed to the Legislatures of the several States, as amendments to the Constitution of the United States, all, or any of which Articles, when ratified by three fourths of the said Legislatures, to be valid to all intents and purposes, as part of the said Constitution; viz.

ARTICLES in addition to, and Amendment of the Constitution of the United States of America, proposed by Congress, and ratified by the Legislatures of the several States, pursuant to the fifth Article of the original Constitution.

Note: The following text is a transcription of the first ten amendments to the Constitution in their original form. These amendments were ratified December 15, 1791, and form what is known as the "Bill of Rights."

Amendment I

Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances.

Amendment II

A well regulated Militia, being necessary to the security of a free State, the right of the people to keep and bear Arms, shall not be infringed.

Amendment III

No Soldier shall, in time of peace be quartered in any house, without the consent of the Owner, nor in time of war, but in a manner to be prescribed by law.

Amendment IV

The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon

probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.

Amendment V

No person shall be held to answer for a capital, or otherwise infamous crime, unless on a presentment or indictment of a Grand Jury, except in cases arising in the land or naval forces, or in the Militia, when in actual service in time of War or public danger; nor shall any person be subject for the same offence to be twice put in jeopardy of life or limb; nor shall be compelled in any criminal case to be a witness against himself, nor be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use, without just compensation.

Amendment VI

In all criminal prosecutions, the accused shall enjoy the right to a speedy and public trial, by an impartial jury of the State and district wherein the crime shall have been committed, which district shall have been previously ascertained by law, and to be informed of the nature and cause of the accusation; to be confronted with the witnesses against him; to have compulsory process for obtaining witnesses in his favor, and to have the Assistance of Counsel for his defence.

Amendment VII

In Suits at common law, where the value in controversy shall exceed twenty dollars, the right of trial by jury shall be preserved, and no fact tried by a jury, shall be otherwise re-examined in any Court of the United States, than according to the rules of the common law.

Amendment VIII

Excessive bail shall not be required, nor excessive fines imposed, nor cruel and unusual punishments inflicted.

Amendment IX

The enumeration in the Constitution, of certain rights, shall not be construed to deny or disparage others retained by the people.

Amendment X

The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people.

Note: The capitalization and punctuation in this version is from the enrolled original of the Joint Resolution of Congress proposing the Bill of Rights, which is on permanent display in the Rotunda of the National Archives Building, Washington, D.C.