

$$\frac{b}{a} = 1.618$$

# BIG BOOK OF

# MATH



A Historical Timeline of Math, Science, and Technology

KATHERINE HANNON

First printing: April 2024

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Space will not allow mentioning all the resources consulted in putting this together. However, a few seem extra worth pointing out due to their value with various concepts. A big thanks also to Joy Dubbs, Christina Loop, Brian Loop, Donna Burke, and Adam Hannon for their help in reviewing this project.

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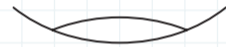
## READ

panel-by-panel at your own pace or look up specific concepts to supplement topics you are already studying. It's an exciting, easy-to-read visual presentation of math, science, and technology from the beginning of God's creation to the modern day!



## EXPLORE

diverse applications of math throughout history in shaping pivotal technologies. Deepen your comprehension of God's world and the mathematical precision that explains it.



## DISCOVER

how math impacts your everyday life, from the simple to the complex, from your computer to music, and more with this 15-foot chart that can be used for math, history, or science.



## LEARN

about mathematicians and scientists — how they have used the consistency of God's creation to make new discoveries and challenges that persist to this day!



**Math Helps Us Explore God's Orderly & Complex World**

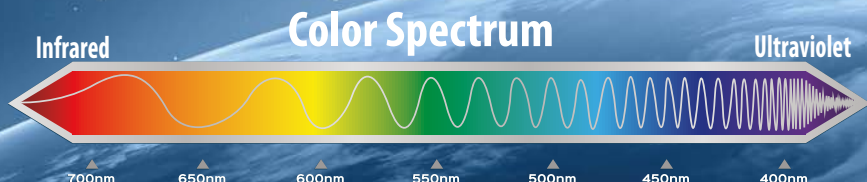
Math works outside of a textbook because it describes the quantities & consistencies around us — quantities and consistencies a triune God created and sustains. 🔗

**Math's Message**

*"Thus says the LORD: If I have not established my covenant with day and night and the fixed order of heaven and earth, then I will reject the offspring of Jacob and David my servant . . ."* (Jeremiah 33:25–26).

God is pointing to creation's consistency — which math describes — **as a reminder of His faithfulness.**

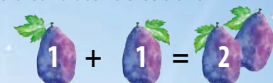
Math reveals and records incredible order within the light that God simply spoke into existence!



The complexities of math reflect the complexities of creation — which was originally perfect. These complexities in turn point us to the greatness and infinitude of the Creator.



**Addition** describes how objects add in God's consistent creation.



**Math Reveals Evidence of the Fall** 🔗



**Example:** Describing the magnitude of an **earthquake**.

$$E=10^{11.8+1.5M}$$

**Science & Technology**

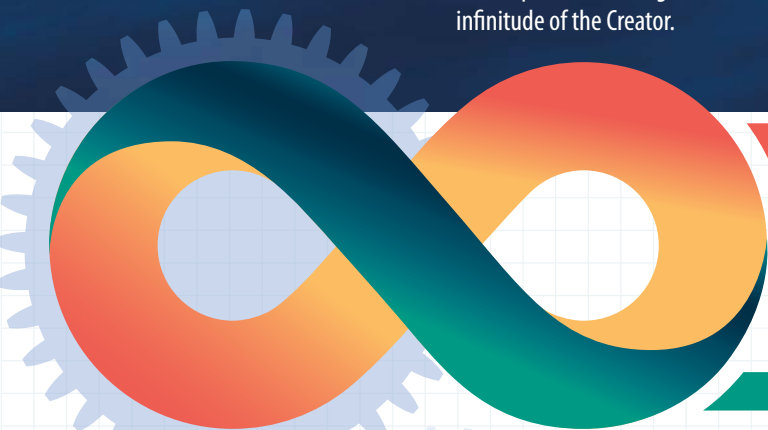
**Mathematicians & Scientists**

**World Events**

**Math Happenings**

**Key Worldview Ideas** are marked with a key. 🔑

Make the most of this timeline using your Guide! Items with a 🔗 have more details in the Guide.



Cain built a city

Musical instruments and bronze & iron made

4004 B.C. • Days 1–6

Man rebelled; death & suffering enter world

God created the heavens & the earth

4004 B.C. • Time began

Day 6

**God gives units of time** (day, week, etc.).

**Origin of Timekeeping**

God is the One who set up night and day, seasons, and years in how He created the earth to rotate on its axis and to orbit around the sun. Ever since then, men have worked to develop timekeeping devices that correspond with what God set up.

The Bible uses **numbers to order** the days of creation (Genesis 1); God established our 7-day week.

**Adam named the animals** (Genesis 2:18–20), which involved looking at God's creation and describing it. That's exactly what we do in math! "1" names a quantity.

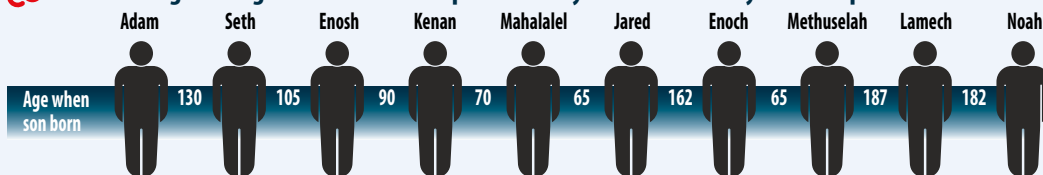
Jubal "was the father of all those who play the **lyre and pipe**" 🔗 (Genesis 4:21). Length of strings and location of holes determine sounds.

**Cain built a city** (Genesis 4:17). Building a city requires measuring, designing buildings, forming straight lines, calculating supplies needed, and more.

Tubal-cain was "the forger of all instruments of **bronze and iron**" (Genesis 4:22); this technology would likely have involved some math, such as measuring. 🔗

**Genealogy Math** 🔗

The genealogies in the Bible help us date key events in history with simple addition!



Time from creation to Noah's birth =  
 $130+105+90+70+65+162+65+187+182 = 1,056$  yrs  
 Noah's age at Flood's start = 600 yrs  
 Time from creation to Flood =  $1,056 + 600 = 1,656$  yrs

God gave Noah specific measurements to **build the Ark** (Genesis 6:15). Noah would have also had to use math for building materials, cages, waste systems, food supplies, etc.

We can also use math to figure out who knew whom. Adam lived 930 years. We can see from what we calculated earlier that he wasn't alive for Noah's birth, as that came 1,056 years after creation (which was the start of Adam's life). If we subtract 182 (Lamech's age at Noah's birth) from that, we get 874 for Lamech's birth, which is less than 930. That means Adam was still alive when Lamech was born but died before Noah's birth at 1,056 years after creation.

Biblical dates are taken from James Ussher's *The Annals of the World*. Dates for events B.C. are mainly approximate. See the "General Notes" section in the Guide for more details.

**Different Math Languages**

God gave man the creativity to express quantities and consistencies differently!

**24 in Different Notations**

At the Tower of Babel, God confused the languages of the people. They then spread out over the earth. As they did, they also developed different symbols for representing quantities and different techniques. Much of math is simply a language system.

**Aztec Indians**



The symbol for twenty and four of the symbol for one.

**Hebrews**



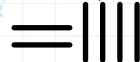
Symbol for four with their symbol for twenty to the right.

**Babylonian\***



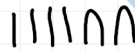
Two of the symbol for ten and four of the symbol for one.

**Chinese Rod System**



~400s B.C. • Two horizontal rods for the tens and four vertical ones for the ones. In the oldest Chinese system, knots were tied on a string to show numbers; another Chinese system is shown on panel 3.

**Egyptian**



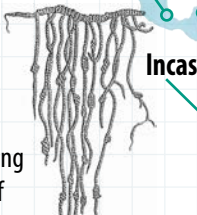
Four of the symbol for one and two of the symbol for ten.

**Mayans\***

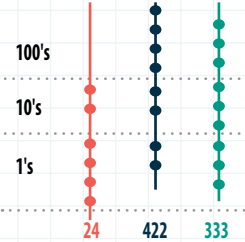


Four of the symbol for one in the one's place and one of the symbol for one in the twenty's place, which is on top of the one's place.

\*Babylonian and Mayan systems are shown on the next page with greater numbers.



In the Inca culture, knots were tied on a rope, called a **quipu**, with the location determining value. 24 would be shown by two knots higher up, representing the tens, and four lower ones of a different type of knot for the ones.



Between the color, length, and type of the rope combined with the type and location of knots, the quipu could record numbers and also what those numbers represented (people in a village, money, etc.). A quipu could be sent from one place to the next, transferring information much like a letter does today.

**Building the Tower of Babel**

required measuring dimensions, designing for stability, determining amount of supplies, leveling building surface, etc.

**Different math languages emerge**



Water drainage system



Stonehenge

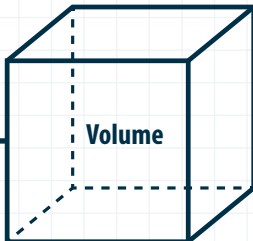
**Civilizations Spring Up**

After the Tower of Babel, civilizations burst forth all over the world, building structures that would have required math, such as a **water storage system** in India and **Stonehenge** in England. Sites like Stonehenge have long baffled historians, as we still don't understand exactly how the stones were hauled and aligned so mathematically. Ancient man was clearly intelligent.

**Comparing the Volumes**

Math helps us see that the Ark had plenty of space!

Volume of the Ark 510 ft x 85 ft x 51 ft	Volume of a 12 ft x 12 ft room with 8 ft ceiling	
≈ 1,880,000 ft <sup>3</sup>	= 1,152 ft <sup>3</sup>	
Volume of the Ark	÷	Volume of room
1,880,000 ft <sup>3</sup>	÷	1,152 ft <sup>3</sup>
	=	# of rooms inside Ark
	≈	1,632

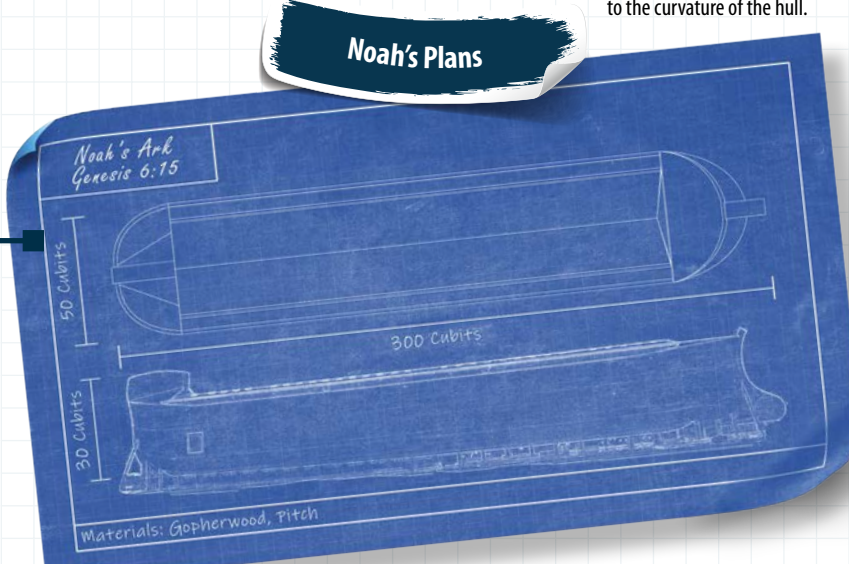


\*The Ark would have had a curved hull; it wasn't a rectangle with 90° angles. This number is an approximate volume based on ignoring the "missing" volume due to the curvature of the hull.

**Ark Dimensions in Cubits & Feet**

1 cubit (cu) ≈ 1.7 ft	
Length	(300 cu) $\left(\frac{1.7 \text{ ft}}{1 \text{ cu}}\right) = 510 \text{ ft}$
Width	(50 cu) $\left(\frac{1.7 \text{ ft}}{1 \text{ cu}}\right) = 85 \text{ ft}$
Height	(30 cu) $\left(\frac{1.7 \text{ ft}}{1 \text{ cu}}\right) = 51 \text{ ft}$
<b>Approximate Volume of the Ark</b>	
510 ft x 85 ft x 51 ft ≈ 1,880,000 ft <sup>3</sup> *	

**Noah's Plans**



Math can help us dig deeper and better understand sizes listed in the Bible.

**Chinese Math**  
7,777 in traditional system

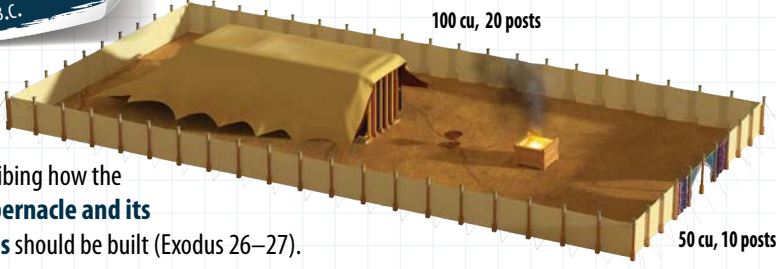


七	Symbol for 7	
七千	Symbol for 1,000	$7 \times 1,000 = 7,000$
七百	Symbol for 700	$7 \times 100 = 700$
七十	Symbol for 70	$7 \times 10 = 70$
七	Symbol for 7	7

**7,000 + 700 + 70 + 7 = 7,777**

**Tabernacle Math**  
1490 B.C.

God used numbers extensively when describing how the **Jewish tabernacle and its furnishings** should be built (Exodus 26–27).



**The Rhind Papyrus**  
1550 B.C. • This document gives us a glimpse into ancient Egyptian mathematics, such as their use of fractions and knowledge of pi.

**Money and Measurements**  
Buying and selling is an important application of math. Israel and many surrounding countries used the shekel. Abraham bought a field for 400 shekels (Genesis 23:15). The Israeli shekel was later defined by the weight of the one kept inside the sanctuary (Exodus 30:13).



**Egyptian Math**

The average stone's weight equals that of a mid-size SUV.  
Weight of stones ~2.5 tons

The pyramids are marvels of mathematical and engineering design.



**Measuring right angles** using a rope with equally spaced knots arranged to form a 3-4-5 right triangle.

**1550 B.C. • Rhind Papyrus**  
 $\frac{1}{5}$  = plus sign (+)  
The Bible tells us that during the famine, Joseph bought the land in Egypt for Pharaoh, **exactng a  $\frac{1}{5}$  tax** (Genesis 47:24).  
Note the use of fractions.



1800s B.C. or earlier • Great Pyramid built | 1500 B.C. • Egyptians use water clocks & sundials | c. 600 B.C. • Hanging Gardens of Babylon

**MAYANS**  
Place Value & Zero

Base-20 Place Value (Mayan)

20's place	••	Represents two 1's in the 20's place, or 40
1's place	◡	Represents 0

2 twenties + 0 ones = forty  
Places progress vertically rather than horizontally.

**0** Notice that the Mayans (above) used the concept of 0, as did the Babylonians (below).



**BABYLONIANS**  
Place value system based on 60.  
No 0 until ~200 B.C. (and then not used in calculations).

**Y** Symbol for 1  
Could be used to mean 1 or 1 set of 60.

Can you imagine writing without 0? It would make place value hard. You wouldn't know if 1 meant 1 or 10 or 100 or 1,000,000. Context would have to be your clue.

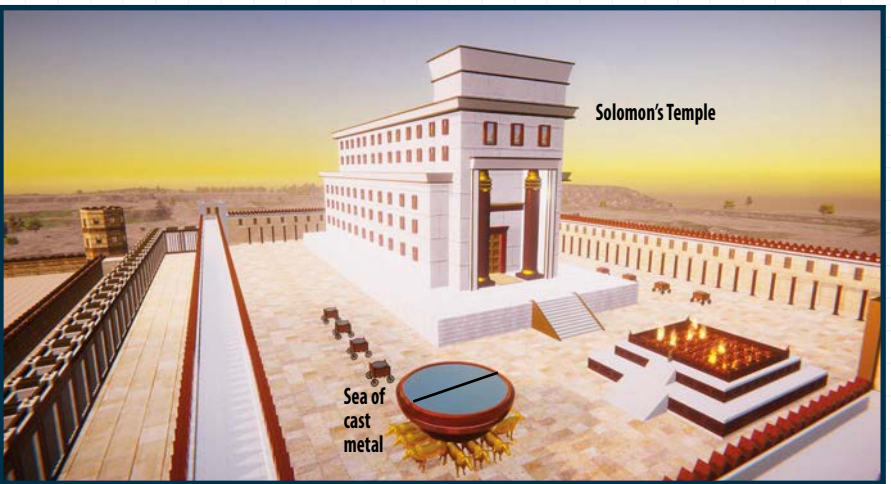
**π** = pi =  $\frac{C}{d} \approx 3.14 \dots$

While this symbol wasn't adopted for pi until the 1700s A.D., men have been working with circles and the ratio between the circumference (C) and the diameter (d) since ancient times. The Rhind Papyrus, for example, gives a value for this ratio of about 3.1605. Pi is an irrational number that can't be fully written out.

**There are aspects of God's creation we can't fully write out!**

**Solomon's Temple Built**  
"Then he made the sea of cast metal. It was round, ten cubits from brim to brim, and five cubits high, and a line of thirty cubits measured its circumference" (1 Kings 7:23).

1004 B.C. • The sea was round — and we're given a diameter of 10 and a circumference of 30. This circumference may have been a rounded value (which would be perfectly acceptable), or the author may have been taking into account the thickness of the basin itself, which would mean he was using a remarkably accurate value for pi.

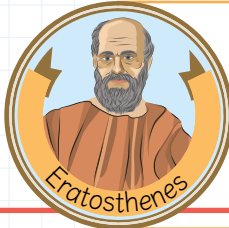


Other creationists have slightly different dates from Ussher for the Exodus (1446 B.C.), the building of the tabernacle (1441 B.C.) and Solomon's Temple (967 or 966 B.C.).

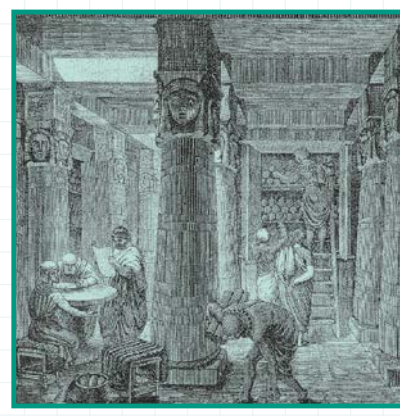
**GEOMETRY**  
"Earth Measure"

Alexandria  
Syrene  
7.5°  
sun's rays at noon

measure of shadow/angle difference from directly overhead = 7.5°  
Distance between cities = 500 mi  
Distance around a circle = 360°  
Distance around the earth =  $x$   
Setting up a proportion:  $\frac{500 \text{ mi}}{7.5^\circ} = \frac{x}{360^\circ}$   
 $x \approx 24,000 \text{ mi}$



**Measuring the Distance Around the Earth**  
200s B.C. • Since the sun formed a 7.5° shadow in Alexandria while it was directly overhead in Syrene, **Eratosthenes** realized the two cities were 7.5° apart on the earth and used math to find the distance around the earth, which is a great circle.



**Alexandrian Library**  
284 B.C. • Famous repository of knowledge built in Alexandria, Egypt. Continued Greek method and knowledge for centuries.

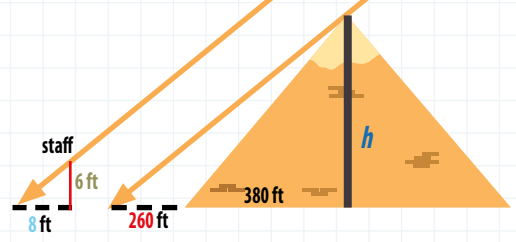
$$\frac{h}{380 + 260} = \frac{6}{8}$$

$$8h = 6(640)$$

$$h = 480 \text{ ft}$$

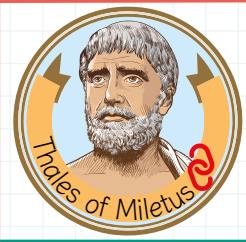
**Height of Great Pyramid**

500s B.C. • **Thales of Miletus** used math to figure out the height of the great pyramid using a staff and knowledge of right triangles.



- Science & Technology
- Mathematicians & Scientists
- World Events
- Math Happenings

500s B.C. • **Thales measures pyramid**



432 B.C. • Parthenon finished  
200s B.C. • Earth's circumference measured  
200s B.C. • Archimedes' screw



246 B.C. • Lighthouse of Alexandria

432 B.C. • Pythagorean theorem      ~300 B.C. • Euclid's Elements  
360 B.C. • Platonic solids      284 B.C. • Alexandrian Library

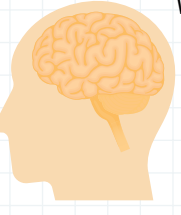
588 B.C. • 1st Jewish temple destroyed & Southern Kingdom fell

336 B.C. • Alexander the Great (Macedonian Empire)

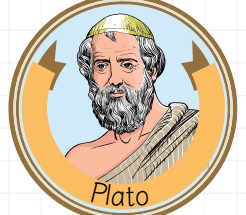
Thales • 640–547 B.C. Heraditus • 540–480 B.C. Hippias • 460–400 B.C. Eudoxus • 408–355 B.C. Euclid • 325–265 B.C. Eratosthenes • 276–194 B.C.  
Pythagoras • 570–500 B.C. Zeno • 495–430 B.C. Plato • 428–348 B.C. Aristotle • 384–322 B.C. Archimedes • 287–212 B.C.

Acharya Pingala • 200s or 300s B.C.

**Greek Thinking**

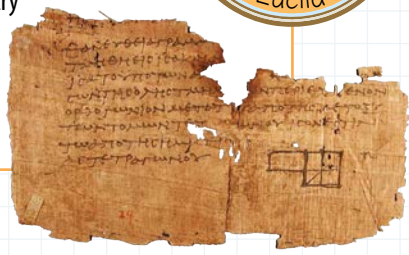


While men have been using math since the beginning, the Greeks were the first to develop a formal approach to mathematics. They were philosophers as well as mathematicians, but sadly, they enthroned human reasoning and ended up with lots of faulty views of creation. While they contributed a lot to geometry, their beliefs kept them from developing much everyday technology.



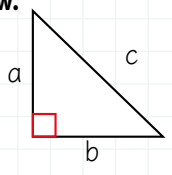
Platonic Solids

~300 B.C. • **Euclid** compiled Greek geometry in the *Elements*, which still forms the basis for what is taught in most high school geometry courses. Greek geometry is even referred to as **Euclidean geometry**.



500s B.C. • **Pythagoras** and his followers believed that all numbers could be reduced to whole numbers (i.e., 1, 2, 3, etc.). For example, 0.25 can be written as  $\frac{1}{4}$ , a division of two whole numbers.

The **Pythagorean theorem** reveals irrational numbers, like  $\sqrt{2}$ , which cannot be written as a whole number or even a fraction! **The Pythagorean theorem itself disproves the Pythagorean worldview.**



if  $a = 1$  and  $b = 1$ ,

$$1^2 + 1^2 = c^2$$

$$1 + 1 = c^2$$

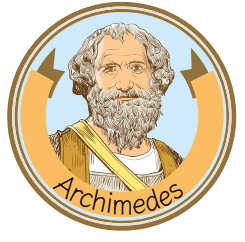
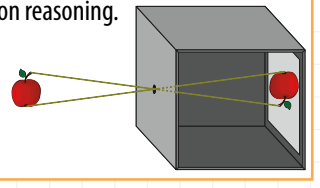
$$2 = c^2$$

$$\sqrt{2} = c$$



300s B.C. • **Aristotle** was a key philosopher/mathematician and teacher of logic who was regarded as the authority for centuries. He encouraged some observations but still placed a huge emphasis on reasoning.

**Aristotle** used a **camera obscura** to observe an eclipse. These devices can be understood with geometry.

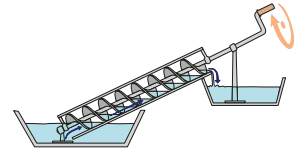


Archimedes • 200s B.C.

**Archimedes and the Crown**



**Archimedes**, who studied in Alexandria, was able to figure out if a supposedly gold crown had silver mixed in, using what he knew about the volumes of gold and silver.



**Archimedes' screw** (origin may have been earlier).



**Archimedes** explored levers and is purported as saying, "Give me a place to stand and with a lever I will move the whole world."<sup>1</sup>