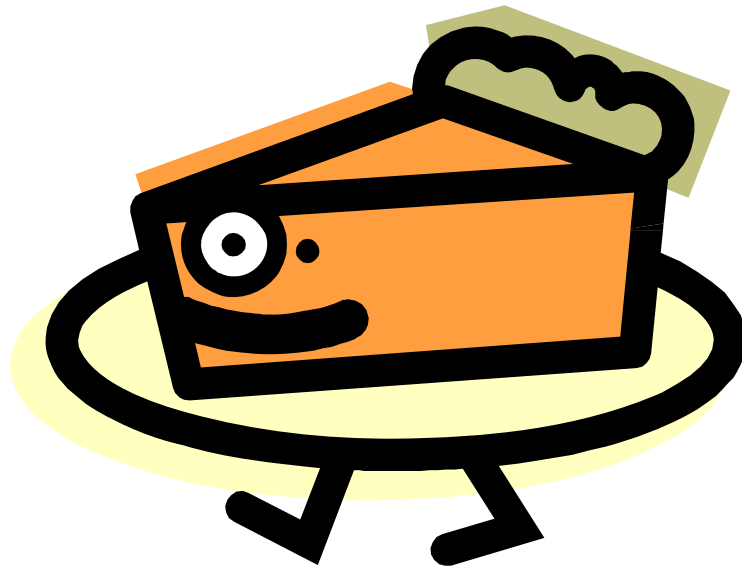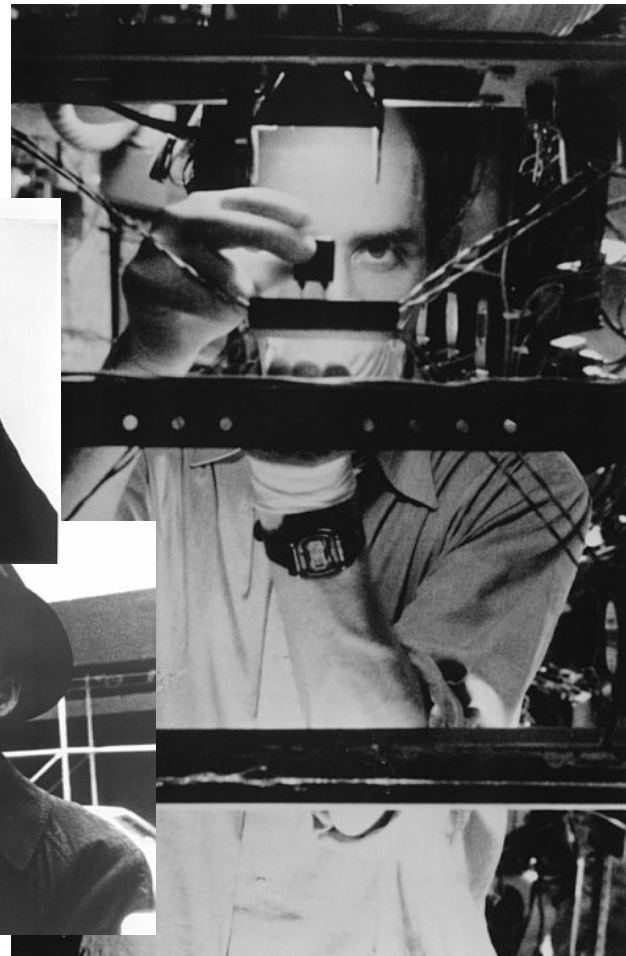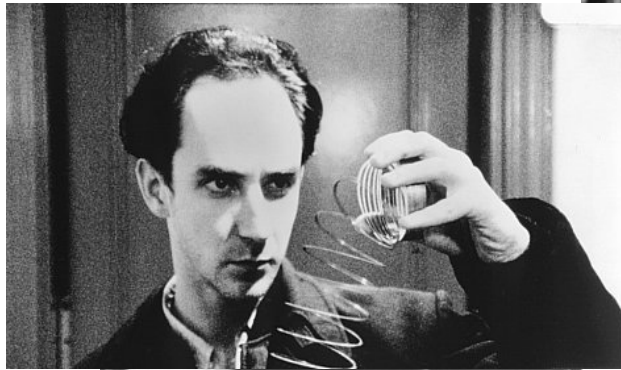# THE TORAH OF *Pi*

Of course by *Pi* we mean not only
Pi the number, but *Pi* the movie (1998).

$$\pi = 3.1415926...$$

So let's start with the movie.
In particular, …

In the movie there is much discussion about a secret name for *God* that contains 216 letters.

So what's up with that number 216?

The origin of this number begins with a Biblical verse from II Kings 4:32-35.

And when Elisha came into the house, behold, the child was dead, and laid upon his bed. He went in therefore, and closed the door upon the two of them, and prayed to the Lord. And he went up, and lay upon the child, and put his mouth upon his mouth, and his eyes upon his eyes, and his hands upon his hands; and he stretched himself upon the child; and the flesh of the child became warm. Then he returned, and walked in the house to and fro; and went up, and stretched himself upon him; and the child sneezed seven times, and the child opened his eyes.

In the *Zohar*, a Jewish mystical work that appeared in the 13th century, this story is expanded.

Elisha traced on him the mystic appellation, consisting of <u>seventy-two names</u>. For the alphabetical letters that his father had at first engraved on him had flown off when the child died; but when Elisha embraced him he engraved on him anew all those letters of the seventy-two names. <u>Now the number of those letters amounts to two hundred and sixteen</u>, and they were all engraved by the breath of Elisha on the child so as to put again into him the breath of life through the power of the letters of the seventy-two names.

And as for the seventy-two names, they come from *Exodus 14:19-21*.

19. And the angel of God, who went before the camp of Israel, moved and went behind them; and the pillar of the cloud went from before their face, and stood behind them;
20. And it came between the camp of the Egyptians and the camp of Israel; and it was a cloud and darkness to them, but it gave light by night to these; so that the one came not near the other all the night.
21. And Moses stretched out his hand over the sea; and the Lord caused the sea to go back by a strong east wind all that night, and made the sea dry land, and the waters were divided.

In Hebrew, each of these verses contains 72 letters, and from these letters 72 three-letter names for *God* are created.

Exodus 14:19-21

19 וַיִּסַּע מַלְאַךְ הָאֱלֹהִים הַהֹלֵךְ לִפְנֵי מַחֲנֵה יִשְׂרָאֵל וַיֵּלֶךְ מֵאַחֲרֵיהֶם וַיִּסַּע עַמּוּד הֶעָנָן מִפְּנֵיהֶם וַיַּעֲמֹד מֵאַחֲרֵיהֶם:

20 וַיָּבֹא בֵּין מַחֲנֵה מִצְרַיִם וּבֵין מַחֲנֵה יִשְׂרָאֵל וַיְהִי הֶעָנָן וְהַחֹשֶׁךְ וַיָּאֶר אֶת־הַלָּיְלָה וְלֹא־קָרַב זֶה אֶל־זֶה כָּל־הַלָּיְלָה:

21 וַיֵּט מֹשֶׁה אֶת־יָדוֹ עַל־הַיָּם וַיּוֹלֶךְ יְהוָה אֶת־הַיָּם בְּרוּחַ קָדִים עַזָּה כָּל־הַלַּיְלָה וַיָּשֶׂם אֶת־הַיָּם לֶחָרָבָה וַיִּבָּקְעוּ הַמָּיִם:

וְהוּ יְלִי ...

To get the first name, you take the first letter of the 1ˢᵗ verse, the last letter of the 2ⁿᵈ verse, and the 1ˢᵗ letter of the last verse. And then, repeat the process.

Exodus 14:19-21

19 וַיִּסַּ֞ע מַלְאַ֣ךְ הָאֱלֹהִ֗ים הַהֹלֵךְ֙ לִפְנֵי֙ מַחֲנֵ֣ה יִשְׂרָאֵ֔ל וַיֵּ֖לֶךְ מֵאַחֲרֵיהֶ֑ם וַיִּסַּ֞ע עַמּ֤וּד הֶֽעָנָן֙ מִפְּנֵיהֶ֔ם וַיַּֽעֲמֹ֖ד מֵאַחֲרֵיהֶֽם׃

20 וַיָּבֹ֞א בֵּ֣ין ׀ מַחֲנֵ֣ה מִצְרַ֗יִם וּבֵין֙ מַחֲנֵ֣ה יִשְׂרָאֵ֔ל וַיְהִ֤י הֶֽעָנָן֙ וְהַחֹ֔שֶׁךְ וַיָּ֖אֶר אֶת־הַלָּ֑יְלָה וְלֹא־קָרַ֥ב זֶ֛ה אֶל־זֶ֖ה כָּל־הַלָּֽיְלָה׃

21 וַיֵּ֨ט מֹשֶׁ֣ה אֶת־יָדוֹ֮ עַל־הַיָּם֒ וַיּ֣וֹלֶךְ יְהוָ֣ה ׀ אֶת־הַיָּ֡ם בְּר֣וּחַ קָדִים֩ עַזָּ֨ה כָּל־הַלַּ֜יְלָה וַיָּ֥שֶׂם אֶת־הַיָּ֖ם לֶחָרָבָ֑ה וַיִּבָּקְע֖וּ הַמָּֽיִם׃

וְהוּ יְלִי
...

This gives us 72 names comprised of 216 letters.

Exodus 14:19-21

19 וַיִּסַּע מַלְאַךְ הָאֱלֹהִים הַהֹלֵךְ לִפְנֵי מַחֲנֵה יִשְׂרָאֵל וַיֵּלֶךְ מֵאַחֲרֵיהֶם וַיִּסַּע עַמּוּד הֶעָנָן מִפְּנֵיהֶם וַיַּעֲמֹד מֵאַחֲרֵיהֶם:

20 וַיָּבֹא בֵּין מַחֲנֵה מִצְרַיִם וּבֵין מַחֲנֵה יִשְׂרָאֵל וַיְהִי הֶעָנָן וְהַחֹשֶׁךְ וַיָּאֶר אֶת־הַלָּיְלָה וְלֹא־קָרַב זֶה אֶל־זֶה כָּל־הַלָּיְלָה:

21 וַיֵּט מֹשֶׁה אֶת־יָדוֹ עַל־הַיָּם וַיּוֹלֶךְ יְהוָה אֶת־הַיָּם בְּרוּחַ קָדִים עַזָּה כָּל־הַלַּיְלָה וַיָּשֶׂם אֶת־הַיָּם לֶחָרָבָה וַיִּבָּקְעוּ הַמָּיִם:

וְהוּ ילי ...

And so the 216 letter name of *God* is either the 216 letters in the order in these verses, or in the order of the 72 names created, or in some other order.

Exodus 14:19-21

19 ויסע מלאך האלהים ההלך לפני מחנה ישראל וילך
מאחריהם ויסע עמוד הענן מפניהם ויעמד מאחריהם:
20 ויבא בין מחנה מצרים ובין מחנה ישראל ויהי הענן
והחשך ויאר את-הלילה ולא-קרב זה אל-זה כל-הלילה:
21 ויט משה את-ידו על-הים ויולך יהוה את-הים ברוח
קדים עזה כל-הלילה וישם את-הים לחרבה ויבקעו המים:
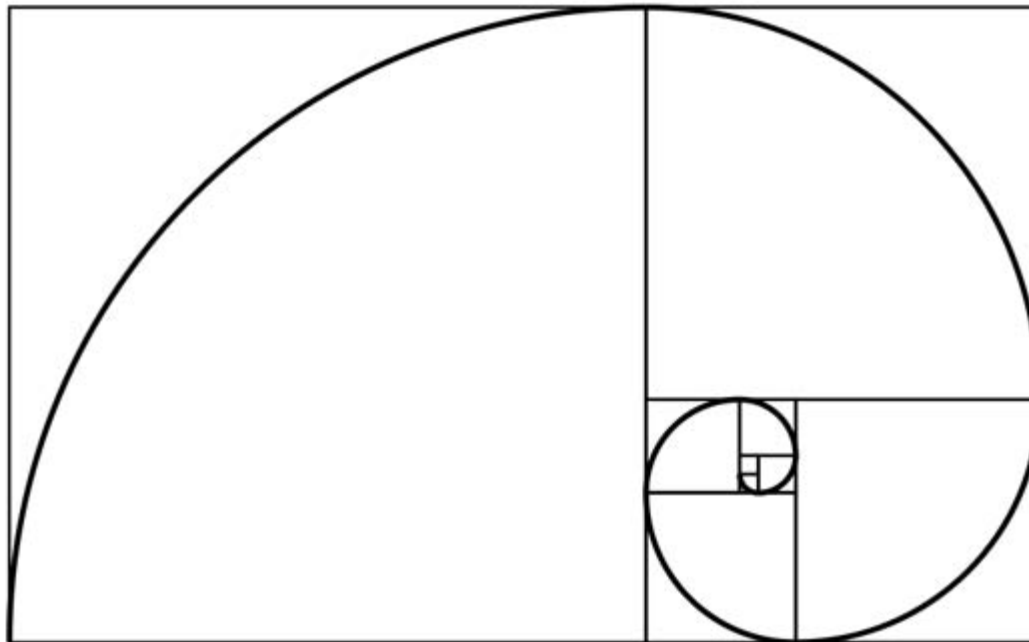
והו יכלי ...

Fortunately, there are only so many distinct permutations that can be made from these 216 letters (see the number below), and surely one of them is the right permutation!
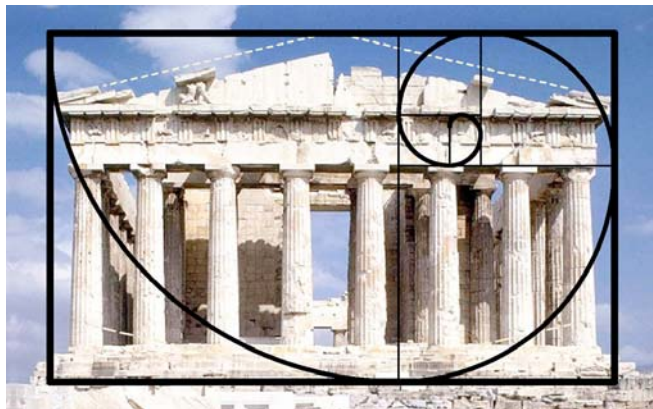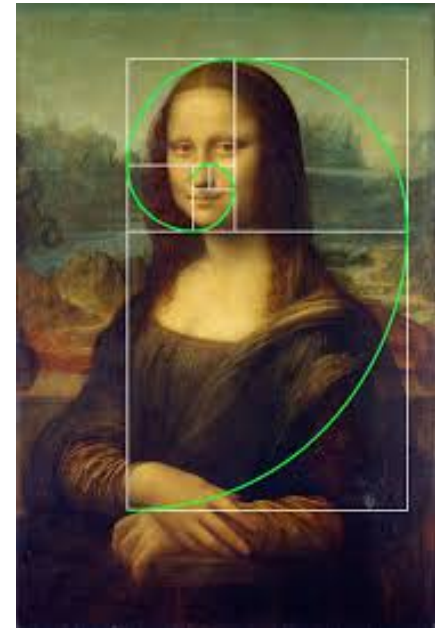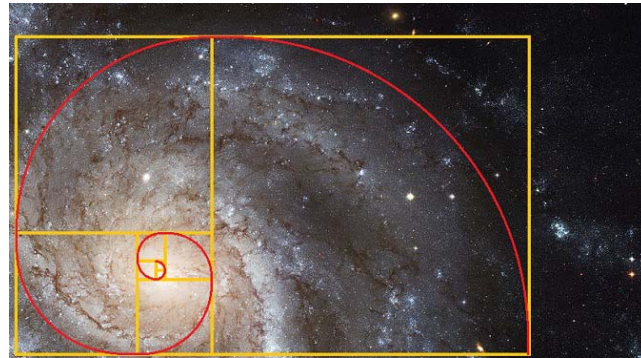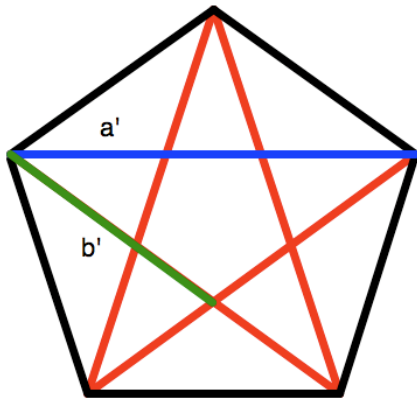
72593136672847806242145731778557935294688690694574587692779249520\
36109553718240847195249788200578200267903871113677877234370475\
53676174474096803837997511640382138825731130773856603376411186\
38941335143854176886581504036044800000000000000

The movie *Pi* also mentions the *Golden Ratio* (1.618034…). This ratio is considered the most pleasing to look at.
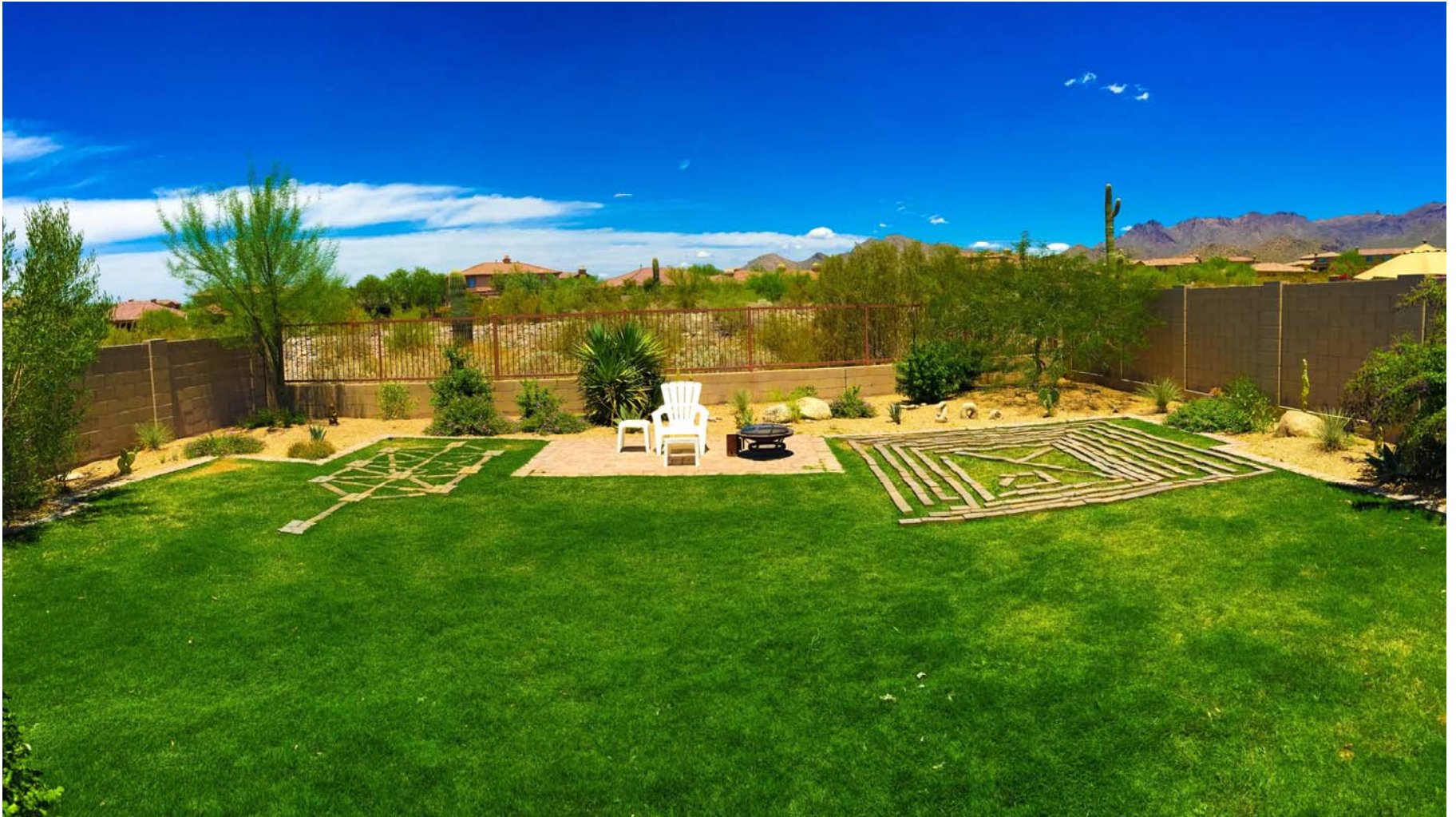
$$\frac{1+\sqrt{5}}{2} \approx 1.618034$$

The *Golden Ratio* appears everywhere from mathematics to spiral galaxies to art to credit cards.

Even the paver patio in my backyard is a *golden rectangle*.

Also, you can find good approximations of the *Golden Ratio* by taking ratios of successive terms of the *Fibonacci sequence*.

Fibonacci Sequence

$$1, 1, 2, 3, 5, 8, 13, 21, ...$$

Fibonacci Ratio Sequence

$$\frac{1}{1}, \frac{2}{1}, \frac{3}{2}, \frac{5}{3}, \frac{8}{5}, \frac{13}{8}, \frac{21}{13}, \frac{34}{21}, ... \rightarrow 1.618034...$$

The ratio of 5 to 3 is the first decent approximation of the Golden Ratio to occur in this sequence.

$$\frac{5}{3} = 1.\overline{6}$$

Fibonacci Sequence

$$1, 1, 2, 3, 5, 8, 13, 21, ...$$

Fibonacci Ratio Sequence

$$\frac{1}{1}, \frac{2}{1}, \frac{3}{2}, \frac{5}{3}, \frac{8}{5}, \frac{13}{8}, \frac{21}{13}, \frac{34}{21}, ... \rightarrow 1.618034...$$

And interestingly, this ratio of 5 to 3 occurs several times in the *Bible*.

$$\frac{5}{3} = 1.\overline{6}$$

Fibonacci Sequence

$$1, 1, 2, 3, 5, 8, 13, 21, ...$$

Fibonacci Ratio Sequence

$$\frac{1}{1}, \frac{2}{1}, \frac{3}{2}, \frac{5}{3}, \frac{8}{5}, \frac{13}{8}, \frac{21}{13}, \frac{34}{21}, ... \rightarrow 1.618034...$$

Noah's Ark (Genesis 6:15)

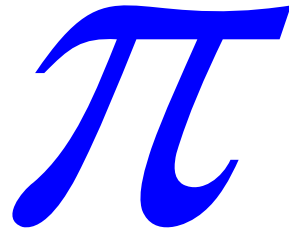$$\frac{50 \text{ cubits}}{30 \text{ cubits}} = \frac{5}{3}$$

Ark of the Covenant (Exodus 25:10)

$$\frac{2\frac{1}{2} \text{ cubits}}{1\frac{1}{2} \text{ cubits}} = \frac{5}{3}$$

The Altar (Exodus 27:1)

$$\frac{5 \text{ cubits}}{3 \text{ cubits}} = \frac{5}{3}$$

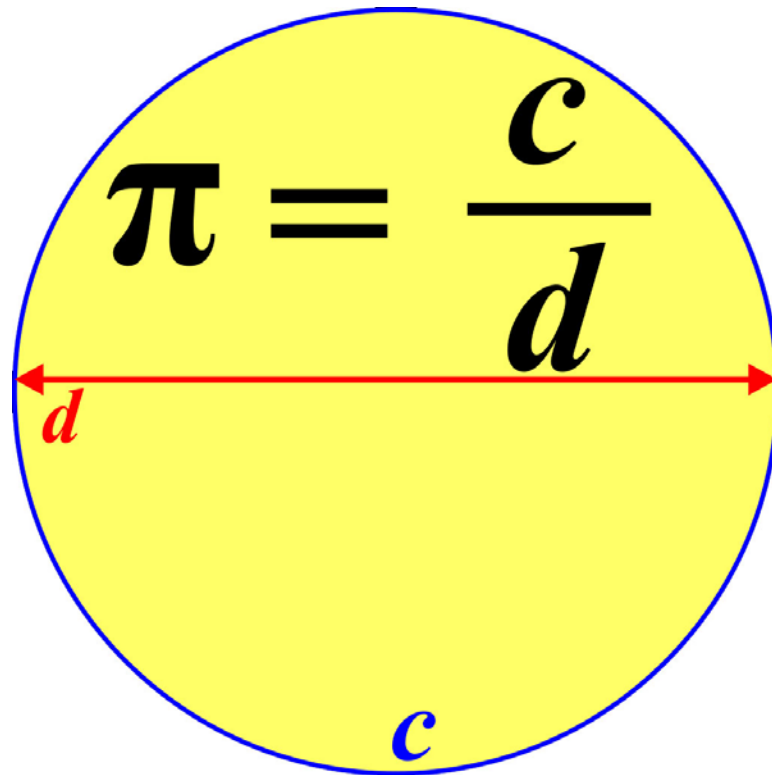Now let's move on from *Pi* the movie to *Pi* the number…

$$\pi$$

Why is this number different from all other numbers?

π

Why is this number different from all other numbers?

We begin to answer …

It's different because for any circle, *Pi* is the ratio of the circumference to the diameter, and this makes *Pi* a fundamental constant of the universe.

$$\pi = \frac{c}{d}$$

d

c

Also, *Pi* is irrational. It's decimal expansion goes on forever without repeating any particular sequence.

3.14159265358979323846264338327950288419716939937510582097494459230781640628620899862803482534211706798214808651328230664709384460955058223172535940812848111745028410270193852110555964462294895493038196442881097566593344612847564823378678316527120190914564856692346034861045432664821339360726024914127372458700660631558817488152092096282925409171536436789259036000113305305488204665213841469519415116094330572703657595919530921861173819326117931051185480744623799627495673518857527248912279381830119491298336733624406566430860213949463952247371907021798609437027705392171762931767523846748184676694051320005681271452635608277857713427577896091736371787214684409012249534301465495853710507922796892589235420199561121290219608640344181598136297747713099605187072113499999983729780499510597317328160963185950244594553469083026425223082533446850352619311881710100031378387528865875332083814206171776691473035982534904287554687311595628638823537875937195778\

By the way, did you notice that the expansion for *Pi* at the beginning of the movie is wrong?

But since we want to look at the "Torah of *Pi*," we'll ask, "Does *Pi* appear in the *Bible*?"
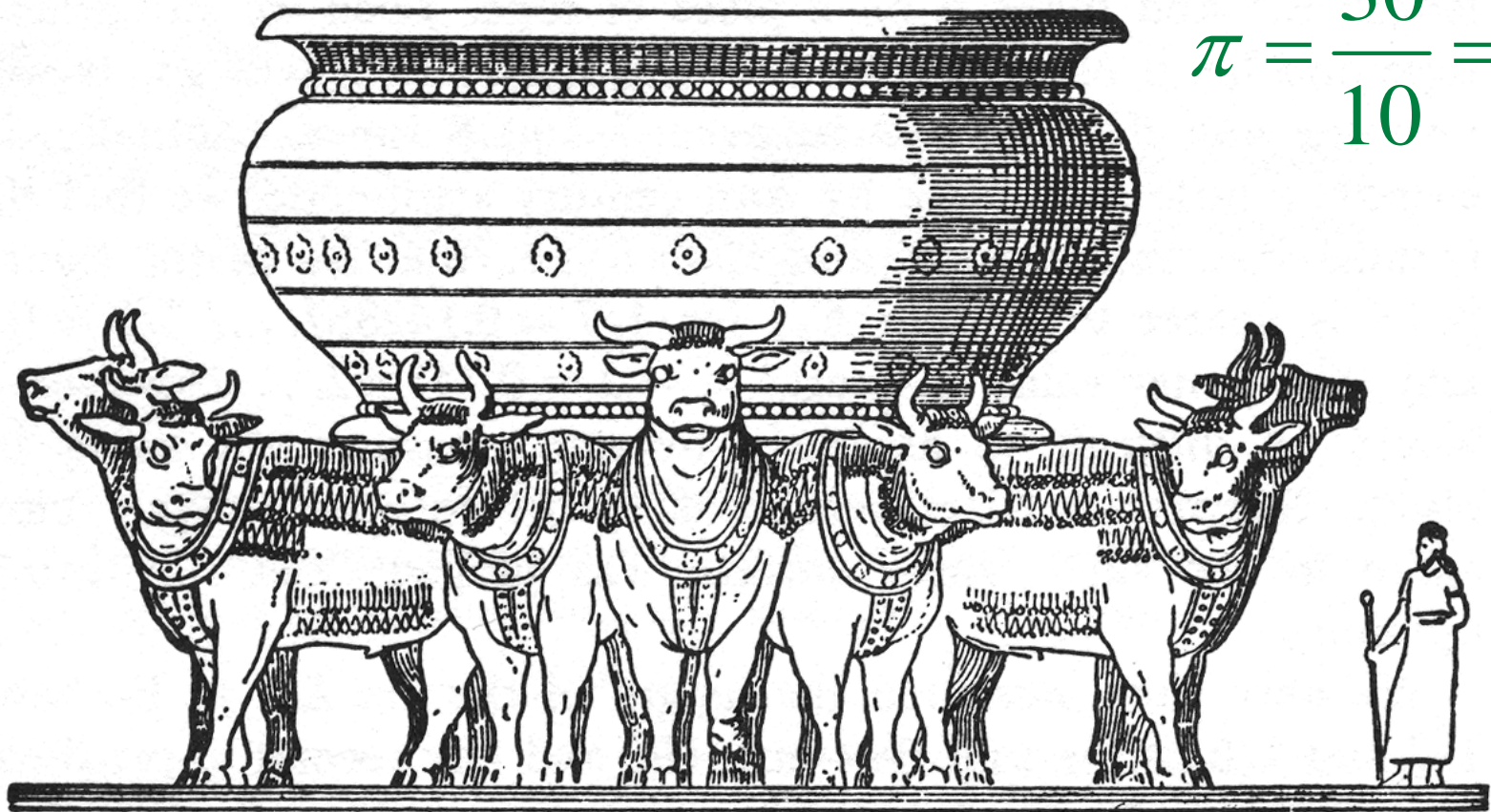
And the answer is, ... sort of.

A verse in the Bible (I Kings 7:23) seems to give an exact value of "3" for *Pi*, and, of course, this value is incorrect.

"He made the sea of a casting ten cubits from one lip to the other lip, circular all around, five cubits its height, a measuring line thirty cubits could encircle it all around." –I Kings 7:23

$$\pi = \frac{30}{10} = 3$$

However, in Hebrew, each <u>letter</u> is also a <u>number</u>, and an odd spelling of the word for "*measuring line*" seems to indicate how to get a value for *Pi* that is accurate to <u>four decimal places</u>. This trick was discovered in the 1700s by a rabbi known as "*The Genius of Vilna*."

measuring line thirty cubits

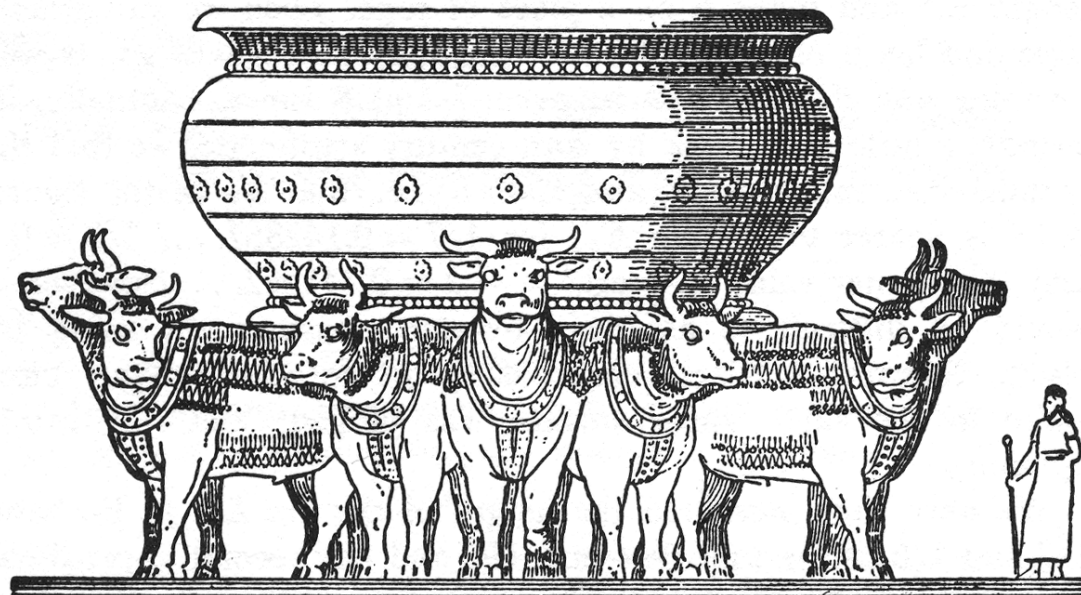קוה שלשים באמה

unusual spelling → קוה = 111

usual spelling → קו = 106

$$\pi = \frac{30}{10} \cdot \frac{111}{106} = 3.141509434\ldots$$

Also, there is a very interesting "*Bible code*" where the digits 3,1,4,1,5 appear in this verse from *First Kings* beginning in the middle of the word for "*circular*." The length of the skip sequence for this code is 8,976 letters.

ג→3

א→1

ד→4

א→1

ה→5

pi

ⓖⒶⒹⒶⒽ ▼   ✖ Cancel

1 4 6 0	1 4 5 9	1 4 5 8	1 4 5 7	1 4 5 6	1 4 5 5	1 4 5 4	1 4 5 3	1 4 5 2	1 4 5 1	1 4 5 0	1 4 4 9	1 4 4 8	1 4 4 7	1 4 4 6	1 4 4 5	1 4 4 4	1 4 4 3	1 4 4 2	1 4 4 1	1 4 4 0	1 4 3 9	1 4 3 8	1 4 3 7	1 4 3 6	1 4 3 5	1 4 3 4	1 4 3 3	1 4 3 2	1 4 3 1

נ ת ת נ ע ת ד ע ש י י ש ע ד ו ש י ג מ י ל ת ת ו ת ת י ר ת ע ז ה ש ו ח נ צ

ד ר מ א ה כ ו י ל א ר מ א י ו ה י ל א ה ל א ו ה י נ ב א כ י

ו ק ה מ א ב ש מ ח ו ב י ס **ל** **ג** **ע** ו ת פ ש ד ע ו ת ש מ ה ה מ א כ

ה נ ה ל ש ד ל מ ה ש ע י י ו ר **א** ה ת ו ח פ ו ב ר ע ה כ ל מ כ ל

נ ר ש א ת א ז ה ה ב ו ט ה ה מ **ד** ה ל ע מ ל א ר ש י ת א ש ת נ

כ א ה ל ע ב א ל ו ה י ל **א** ר מ א י ו ס ש ט ח י ש ו ר ו ט

מ ו ס י ש ל ש ן ב ט פ ש ו **ה** י ל א ר ש י ך ל מ ב א ח א ל א ע מ

י א נ ה נ ה ר מ א י ו ו י נ פ ל ד מ ע י א ו ב י ו ה נ ה ח נ מ ל כ

נ ק ז ה ל א ע ר ז י י ר ש ל א ן ו ר מ ש ה ל ש י ו ס י ר פ ס א י

ס ל ע י ב ו ת כ ה ס ה א ה ל ה ה ש ע ר ש א ל כ ו ר י ה ז ד ע י

Coincidence? Maybe, but either way be sure to celebrate *Pi Day* by enjoying some delicious pizza!

$$pi = \frac{pizza}{zza}$$

"There is nothing better for a man than that he should eat and drink!" (*Ecclesiastes* **2:24**)

HAPPY PI DAY!