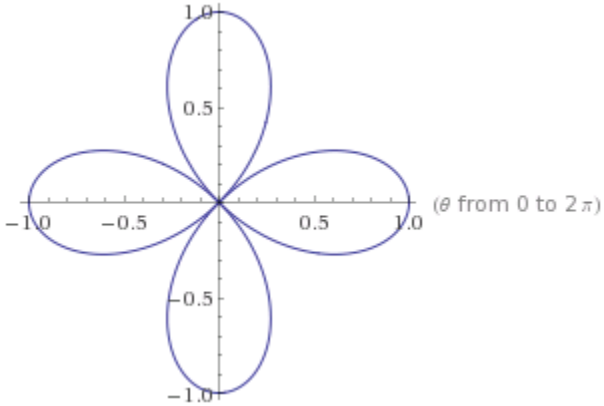
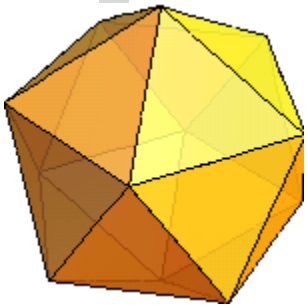
Cyphertext: **ABCDEFGHIJKLMNOPQR** **421261450043257479**

A is the number of peddles in the r = cos(2θ) flower. 4



Binary is base **B** Binary is Base 2

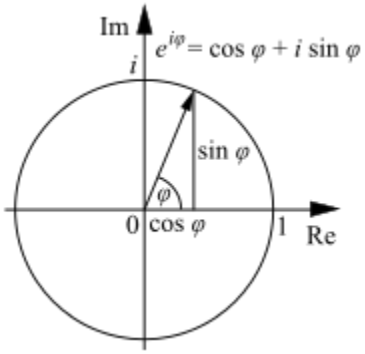
CD is the number of vertices in an icosahedron. 12



A boy has a penny, nickel, dime, and quarter. He can create **E** unique dollar amounts using 2 coins.

4 chose 2 = $4!/(2!)^2 = 6$ (see Binomial theorem)

F = $-e^{i\pi} = 1$ (from Eurler's identity)



Jose and Jota just became friends with Jeremiah, and they want to know his birthday. Jeremiah gave J&J 10 possible dates: May 6, June 7, July 2, Aug 2, May 4, June 8, July 4, Aug 6, May 9, and Aug 7. Jeremiah tells Jose his birth month and he tells Jota the day of his birthday.

Jose says: “I don’t know Jeremiah’s birthday, but I know Jota doesn’t know either.”
Jota says: “Ah, I didn’t know Jeremiah’s birthday either, until you told me that!”
Jose says: "Then I also know Jeremiah’s birthday!"

G = the day of the birthday.

To solve this puzzle, you make a matrix.

	May	June	July	Aug
2			x	x
4	x		x	
6	x			x
7		x		x
8		x		
9	x			

Since Jose says that Jota doesn't know the date, this means that month is not May or June because if the month was May, there could be a chance that the date was May 9 and Jota would know. And if the month was June it could have been June 8 and Jota would have known the date. Therefore we're left with July and August dates:

	May	June	July	Aug
2			x	x
4	x		x	
6	x			x
7		x		x
8		x		
9	x			

Since Jose eliminated all these dates, and Jota knows the birth date, so we know that is cannot be July 2 or Aug 2 because he would not have known the birthday.

	May	June	July	Aug
2			x	x
4	x		x	
6	x			x
7		x		x
8		x		
9	x			

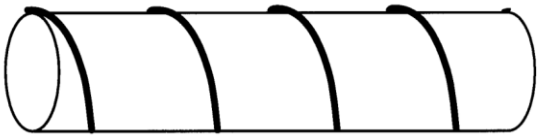
So now we're down to 3 dates. Since at the end Jose says that he also knows the date, it could not be August because he knows the date. Therefore, it's July 4th.

	May	June	July	Aug

2			x	x
4	x		x	
6	x			x
7		x		x
8		x		
9	x			

[Adopted from Singapore and Asian School Math Olympiads (SASMO) test question http://www.telegraph.co.uk/education/educationnews/11534378/When-is-Cheryls-birthday-The-tricky-math-problem-that-has-everyone-stumped.html]

A string is wound evenly around a circular rod 4 times over the length of the rod. The rod has a length of 4 and a diameter of $3/(4\pi)$. **H** is the length of the string.



Pythagorean theorem with one side of the triangle = rod length (4) and the other side of the triangle = 4 times the circumference of the rod = ¾. So $\text{sqrt}(4^2 + 3^2) = 5$

5☺8=60, 7☺8=98, 6☺7=72, 4☺5=32, 3☺7=27, 1☺0=**I**

A*(A+B-1) so 1*0 = 0.

$\boldsymbol{J} = \int_0^{\pi} \sin(cos\theta)d\theta$ = 0

It's WWII and the Nazis want to make a statement to the US. They must, at all costs, get a Unterseeboot to New York City from Europe. Unfortunately, German engineering isn't all it's cracked up to be and all their U-boats can only hold fuel required to make it ½ the distance to the US, but they have the ability to transfer fuel underwater. It takes **K** boats total to invade those damn 'mericans?

It takes 4 U-boats. All 4 subs travel 1/6th the distance and the 1st boat tops off the other 3 so fuel levels are [1/3, 1/3, 1/3, 1/3] → [0, ½, ½, ½] in terms of distance. They travel another 1/6th the distance and the 2nd tops off the last 2 [0, 1/3, 1/3, 1/3] → [0, 0, ½, ½]. The remaining 2 travel 1/6th the distance and the 3rd tops off the last one which then travels to the US. [0, 0, 1/3, 1/3] → [0, 0, 1/6, ½].

Modified from http://www.mathsisfun.com/puzzles/cars-across-the-desert-solution.html

A construction company figured out that a bricklayer and a half could build a building and a half in a week and a half. It would take **L** equivalently skilled bricklayers to construct a dozen buildings in six weeks?

It takes 1.5 man-weeks per building. 12 buildings = 18 man-weeks, so it would take 3 men 6 weeks to complete.

2 9 3 1 8 4 3 6 5 7 **M**

2. Sequence 2, 3, 4, 5, 6, … interweaved with 9, 18, 36, 72, …

N = $\sum_{n=1}^{\infty} \frac{5}{2^n} = 5\sum_{n=1}^{\infty} \frac{1}{2^n} = 5$

Including the bogus bleep at the end, **O** is the units digit of the number of bleeps in this video: https://www.youtube.com/watch?v=B-Wd-Q3F8KM

17 bleeps, so O = 7

P is the 3rd Motzkin number, M_3.

Motzkin numbers M_n for n=0,1,… form the sequence: 1, 1, 2, **4,** 9, 21, 51, 127, 323 which is the number of different ways of drawing non-intersecting chords between n points on a circle

There's an integer n in which the last 4 digits of n^2 are the same as n. **Q** is the tens value of n and n^2.

7 because 9376^2 = 87909376

At a crazy lesbian orgy, everyone had sex with everyone else once. There were 36 sessions of heavy scissoring and **R** satisfied ladies.

R chose 2 = 36, or (R)(R-1)/2 = 36 so R = 9.