

Shuffle a deck of cards eight times.

Do it perfectly each time.

Then you are back to where you
started.

Nice card trick.

Why does it work?

If you are curious,
take CS 340/Math 340
Spring 2025.



<http://www.ms.uky.edu/~jrge/340/>

There are three people.

On each person we put
either a blue or red hat.

Each person can see the color
of the hats of the other two.

They are not allowed to talk.

At the same time they have to guess
the color of their own hats.

Each of them says red, blue or pass.

If one of them is wrong, they lose.

If at least one of them is right they win
\$1,000,000.

What is their best strategy?

If you are curious,
take CS 340/Math 340 Spring 2025.



<http://www.ms.uky.edu/~jrge/340/>

How are
an old Greek,
a French lawyer and
a Swiss man
involved in
you sending
your credit card number
over
the internet?

If you are curious,
take CS 340/Math 340
Spring 2025.



<http://www.ms.uky.edu/~jrge/340/>

How do you send
pictures
from Mars
over
noisy channels
and still
get
a clear picture
to give
to CNN?

If you are curious,
take CS 340/Math 340
Spring 2025.



<http://www.ms.uky.edu/~jrge/340/>

Your friend(?)

claims that

34034065601122854197959819122215174693

is a prime number.

How do you

prove her/him

wrong?

If you are curious,

take CS 340/Math 340

Spring 2025.



<http://www.ms.uky.edu/~jrge/340/>

What is the probability
that two people
in this room
have the same
birthday?

What does this
have to do
with

factoring

LARGE numbers?

If you are curious,
take CS 340/Math 340
Spring 2025.



<http://www.ms.uky.edu/~jrge/340/>

How come
your cat
can scratch
your favorite cd
and
still
it
sounds
great?

If you are curious,
take CS 340/Math 340
Spring 2025.



<http://www.ms.uky.edu/~jrge/340/>

How do
pineapples
relate
to the
greatest
common divisor?

If you are curious,
take CS 340/Math 340
Spring 2025.



<http://www.ms.uky.edu/~jrge/340/>

What do
cicadas
know
about
prime
numbers?

If you are curious,
take CS 340/Math 340
Spring 2025.



<http://www.ms.uky.edu/~jrge/340/>

How
did
the
twin primes
824633702441
and
824633702443
improve
your
Pentium chip?

If you are curious,
take CS 340/Math 340
Spring 2025.



<http://www.ms.uky.edu/~jrge/340/>

The
NEW
engineering
MATH:
error correcting codes
and
public key cryptography.

If you are curious,
take CS 340/Math 340
Spring 2025.



<http://www.ms.uky.edu/~jrge/340/>

Fermat
thought
 4294967297

was
prime.

He
was
wrong.

If you are curious,
take CS 340/Math 340
Spring 2025.



<http://www.ms.uky.edu/~jrge/340/>

Why

is

the inequality

$$|\ln(\text{lcm}(1,2,\dots,n)) - n| < 2 \sqrt{n} (\ln(n))^2$$

for n greater than 100

worth

a million dollars?

If you are curious,

take CS 340/Math 340

Spring 2025.



<http://www.ms.uky.edu/~jrge/340/>

Why do QR codes

survive coffee?



Curious?

Scan it!

Is
there
life
after
CALCULUS?

If you are curious,
take CS 340/Math 340
Spring 2025.



<http://www.ms.uky.edu/~jrge/340/>