

e to the i pi's a minus by Andy "Dijon" French

To the tune of *Lucy in the Sky with Diamonds* by The Beatles

A A7 D Dm
 Picture your numbers as points horizontal
 A A7 D Dm
 With negatives left, and positives right
 A A7 D Dm
 But, what number squared, equals a minus?
 A A7 F#m Dm
 I'll imagine this number called i.....

Bb C
 Argand and Wessel, they took a bold step
 F Bb
 Adding a vertical axis
 C G
 Go up, not along one, from zero, they said
 D D7
 Mathmā *mutatis mutandis*¹

A A7 D Dm
 Now we can factorize every quadratic
 A A7 D Dm
 Polynomials have roots in conjugate pairs
 A A7 D Dm
 De-Moivre and Euler, they used an expansion
 A A7 F#m Dm
 To prove a relation, which I shall declare:

G C D
 e to the i pi's a minus
 G C D
 e to the i pi's a minus
 G C D
 e to the i pi's a minus
 A
 Ahhhhhhhhhhhhh.

A A7 D Dm
 This amazing connection makes powers rotations
 A A7 D Dm
 Roots of a number, like spokes of a wheel
 A A7 D Dm
 Trigonometric identities, easily proven
 A A7 F#m Dm
 And now logs don't have to be real

Bb C
 But lurking within, a quadratic sequence
 F Bb
 One line of algebra long
 C G D D7
 Is the complex, the fractal Mandelbrot set

And it's all because...

G C D
 e to the i pi's a minus
 G C D
 e to the i pi's a minus
 G C D
 e to the i pi's a minus
 A
 Ahhhhhhhhhhhhh.

A A7 D Dm
 Picture your numbers as points horizontal
 A A7 D Dm
 With negatives left, and positives right
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 But, what number squared, equals a minus?
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 e to the i pi's a minus
 G C D
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 G C D
 e to the i pi's a minus
 A
 Ahhhhhhhhhhhhh

(Repeat in a self similar fashion...!!)

$$e^{i\pi} = -1$$

By Andy "Dijon" French. May 2019

¹ *Mutatis mutandis* : Used when comparing two or more cases or situations. Making necessary alterations while not affecting the main point at issue.

Lucy In The Sky With Diamonds chords
The Beatles 1967 (Sgt. Pepper's Lonely Hearts Club
Band)

A A7 D Dm
Picture yourself in a boat on a river
A A7 D Dm
With tangerine trees and marmalade skies
A A7 D Dm
Somebody calls you, you answer quite slowly
A A7 F#m Dm
A girl with kaleidoscope eyes

Bb C F
Cellophane flowers of yellow and green, towering
Bb
over your head
C G
Look for the girl with the sun in her eyes and she's
D D7
gone

G C D G C D
Lucy in the Sky with Diamonds. Lucy in the Sky with
Diamonds
G C D A
Lucy in the Sky with Diamonds. Ahhhhhhhhhhhh.

A A7 D Dm
Follow her down to a bridge by a fountain
A A7 D Dm
Where rocking horse people eat marshmallow pies,
A A7 D Dm
Everyone smiles as you drift past the flowers,
A A7 F#m Dm
That grow so incredibly high.

Bb C
Newspaper taxis appear on the shore,
F Bb
Waiting to take you away.
C G
Climb in the back with your head in the clouds,
D D7
And you're gone.

G C D G C D
Lucy in the Sky with Diamonds. Lucy in the Sky with
Diamonds
G C D A
Lucy in the Sky with Diamonds. Ahhhhhhhhhhhh.

A A7 D Dm
Picture yourself on a train in a station,
A A7 D Dm
With plasticine porters with looking glass ties,
A A7 D Dm
Suddenly someone is there at the turnstile,
A A7 F#m Dm
The girl with kaleidoscope eyes.

G C D G C D
Lucy in the Sky with Diamonds. Lucy in the Sky with
Diamonds
G C D A
Lucy in the Sky with Diamonds. Ahhhhhhhhhhhh. 6x