

Welcome "Attendance Quiz" for Dr. Z.'s June 30, 2026 DIMACS REU Lecture

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1. Who was (or is) Paul Erdős?

A very prolific mathematician of the 20th century.

Worked in combinatorics, graph theory.

2. Define "Erdős Number".

Let G be a graph with mathematicians as vertices
and co-publication as edges. Erdős number is distance from Erdős in G .

3. Define the number two.

The set $\{0, 1\}$

4. Define the number e .

$$\sum_{n=0}^{\infty} \frac{1}{n!}$$

5. Define the number π .

Twice the smallest positive value where the function $x \mapsto \sum_{n=0}^{\infty} \frac{(-1)^n}{(2n+1)!} x^{2n+1}$ attains 1

6. Define the Catalan number $C(n)$. Name at least one combinatorial family that it counts.

binary rooted trees with n inner vertices

$$\frac{1}{2n+1} \binom{2n+1}{n}$$

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1. Who was (or is) Paul Erdos?

Paul Erdos is one of the most famous mathematicians of all time.

2. Define "Erdos Number".

Erdos Number is how many degrees of collaboration you are from Paul Erdos. More specifically, Erdos himself is the only person with an Erdos number of 0, and your Erdos number is one more than the minimum of your collaborators.

3. Define the number two.

Two is the smallest (and only even) prime number.

4. Define the number e

e is the constant such that $\frac{d}{dx} e^x = e^x$.
 $\uparrow$ only (?)

5. Define the number π

π is the ratio between the circumference and diameter of any circle.

6. Define the Catalan number $C(n)$. Name at least one combinatorial family that it counts.

I don't know.

Welcome "Attendance Quiz" for Dr. Z.'s June 30, 2026 DIMACS REU Lecture

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1. Who was (or is) Paul Erdős?

Erdős Pál, Hungarian, pioneer in graph theory & discrete math
Famous for traveling around & giving people problems
(over 500 direct collaborators)

2. Define "Erdos Number".

How close a mathematician is to collaborating
with Erdős, i.e., direct collab is Erdős number 1.

3. Define the number two.

the second number in the standard ordered enumeration of $\mathbb{N} \setminus \{0\}$

4. Define the number e .

$$\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n = \sum_{n=0}^{\infty} \frac{1}{n!}$$

5. Define the number π .

$\frac{1}{2}$ the ratio between the circumference & radius of any circle

6. Define the Catalan number $C(n)$. Name at least one combinatorial family that it counts.

$$C(n) =$$

A combinatorial family is the number of under-diagonal
paths from corner to corner on an $n \times n$ chessboard.

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NAME: (print!) Arnav Singere

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1. Who was (or is) Paul Erdos? Number theorist.

Famous Mathematician in the 20th century, many conjectures provided by him. Around 50 I think.

2. Define "Erdos Number".

Shortest path from a person to Paul Erdos, in the social companion graph. Erdos number 2 means I know someone that knows Paul Erdos.

3. Define the number two.

1+1. Only even prime number.

4. Define the number e

Natural logarithmic base. Motivation $\frac{a^x - a^0}{x}$

want to extract: $\lim_{h \rightarrow 0} \frac{a^h - 1}{h}$ $\rightarrow \lim_{h \rightarrow 0} \frac{a^h - 1}{h} \rightarrow 1$ when $a = e!$

5. Define the number π

Ratio of circumference to the diameter of any circle.

6. Define the Catalan number $C(n)$. Name at least one combinatorial family that it counts.

A recursively defined sequence. Counts the number of binary ^{search} trees possible for n objects. $C(n)$
Some properties: $a_n \equiv 0 \pmod{2} \iff n = 2^k$ for some $k \in \mathbb{N}$

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1. Who was (or is) Paul Erdős?

Discrete Mathematician famous for being very very prolific, eccentric, and (quite) funny. They have many problems, Erdős problems. They posed.

2. Define "Erdős Number".

The collaboration distance from a ^{researcher} ~~student~~ to Paul Erdős.

3. Define the number two.

Successor of ~~one~~ 1. $\mathbb{Q}$
I guess define ~~field~~ $\mathbb{F} = \mathbb{Q}$ ~~over~~ addition and
~~group~~
 $2 := 1 + 1$ where 1 is the multiplicative identity.

4. Define the number e .

$$\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n.$$

5. Define the number π .

Ratio of the circumference to radius of circle.
(equivalently, circumference of radius 1 circle.)

6. Define the Catalan number $C(n)$. Name at least one combinatorial family that it counts.

$C(n) := \frac{1}{n+1} \binom{2n}{n}$? Count number of length n ± 1 -step paths that stay above 0.
Or number of proper parenthesization

Welcome "Attendance Quiz" for Dr. Z.'s June 30, 2026 DIMACS REU Lecture

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1. Who was (or is) Paul Erdős?

Paul Erdős was a famous mathematician. I know him for some conjectures like sets. A well known result $\sum_{i \in A} \frac{1}{i} \rightarrow \infty$ contains arithmetic progressions and he used probabilistic method.

2. Define "Erdős Number"

A person with Erdős number 1 is written a paper with Erdős has number 0. Let S_p be the set of people a person p has coauthored a paper with. Erdős Number $(p) = 1 + \min_{q \in S_p} \text{Erdős Number}(q)$.

3. Define the number two.

In logic, something like success or 1. In $\mathbb{C}$, defined as $1 + i$.

4. Define the number e .

$$\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n$$

5. Define the number π .

Circumference over diameter of a circle,

$$\frac{\pi}{4} = 1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \dots$$

6. Define the Catalan number $C(n)$. Name at least one combinatorial family that it counts.

$$C(0) = 1, \quad C(1) = 1, \quad C(n) = C(1)C(n-1) + C(2)C(n-2) + \dots + C(n-1)C(1)$$

Dyck paths count them.