!!Math Club!!

Mr. Allee & Dr. Dave

Fairview Elementary

2025–2026

Introductions

Say your:

- Name/nickname (what you want us to call you)
- Grade
- Something in math you don't know
- Example: Dr. Dave; grade 21+; don't know functional derivatives

What is math?

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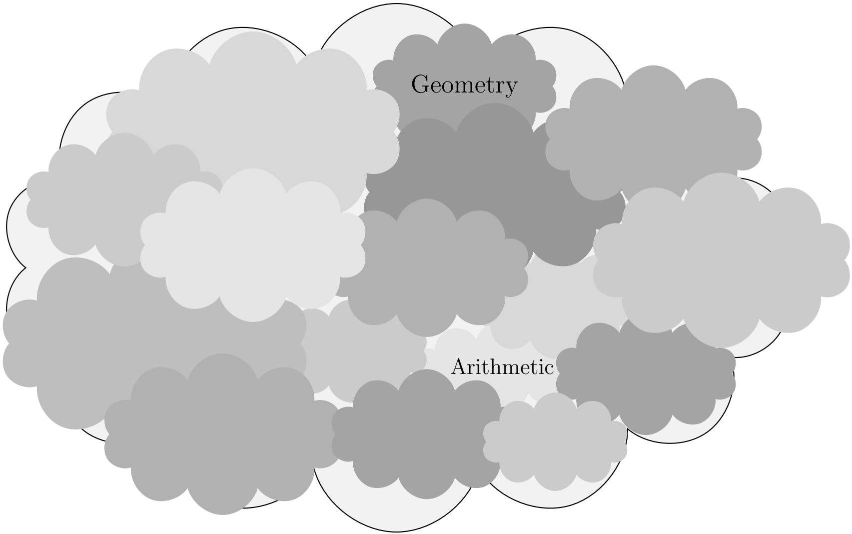
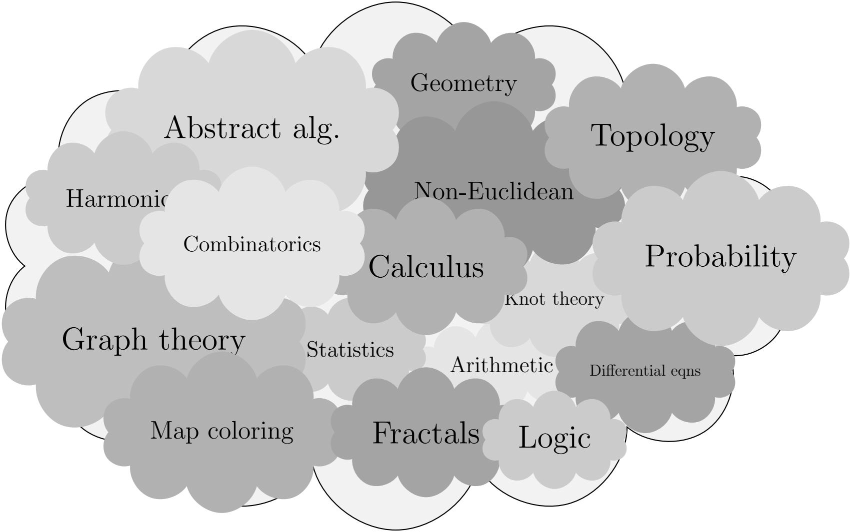


What is math?


Geometry
Abstract alg.
Topology
Harmonic
Non-Euclidean
Combinatorics
Probability
Calculus
Knot theory
Graph theory
Statistics
Arithmetic
Differential eqns
Map coloring
Fractals
Logic

Some math from Dr. Dave's research

$$
\begin{aligned}
&\mathrm{P}\{\hat{b}_1(f) \leq P^a f - P^b f \leq \hat{b}_2(f) \text{ for all } f \in \mathcal{F}\} \\
&= \mathrm{P}\{\overbrace{(\mathbb{P}_n^a - \mathbb{P}_n^b)f - \left|\tilde{T}\right|_{1-\alpha}^{\mathcal{F}\vee} \hat{\sigma}_f/\sqrt{n_a}}^{\hat{b}_1(f) \text{ from } (23)} \leq P^a f - P^b f \leq \overbrace{(\mathbb{P}_n^a - \mathbb{P}_n^b)f + \left|\tilde{T}\right|_{1-\alpha}^{\mathcal{F}\vee} \hat{\sigma}_f/\sqrt{n_a}}^{\hat{b}_2(f) \text{ from } (23)},\ \forall f \in \mathcal{F} \\
&= \mathrm{P}\{-\left|\tilde{T}\right|_{1-\alpha}^{\mathcal{F}\vee} \hat{\sigma}_f/\sqrt{n_a} \leq [(P^a - P^b) - (\mathbb{P}_n^a - \mathbb{P}_n^b)]f \leq \left|\tilde{T}\right|_{1-\alpha}^{\mathcal{F}\vee} \hat{\sigma}_f/\sqrt{n_a} \text{ for all } f \in \mathcal{F}\} \\
&= \mathrm{P}\{-\left|\tilde{T}\right|_{1-\alpha}^{\mathcal{F}\vee} \leq \overbrace{\sqrt{n_a}[(P^a - P^b) - (\mathbb{P}_n^a - \mathbb{P}_n^b)]f/\hat{\sigma}_f}^{-\hat{T}_f \text{ from } (15)} \leq \left|\tilde{T}\right|_{1-\alpha}^{\mathcal{F}\vee} \text{ for all } f \in \mathcal{F}\} \\
&= \mathrm{P}\{\left|\hat{T}_f\right| \leq \left|\tilde{T}\right|_{1-\alpha}^{\mathcal{F}\vee} \text{ for all } f \in \mathcal{F}\} \\
&= \mathrm{P}\{\quad \overbrace{\sup_{f \in \mathcal{F}} \left|\hat{T}_f\right|}^{\left|\hat{T}\right|^{\mathcal{F}\vee} \text{ from } (15)} \quad \leq \left|\tilde{T}\right|_{1-\alpha}^{\mathcal{F}\vee}\} \\
&\to 1 - \alpha
\end{aligned}
$$

because $\left|\hat{T}\right|^{\mathcal{F}\vee} \xrightarrow{d} |T|^{\mathcal{F}\vee}$ by Corollary 3 and $\left|\tilde{T}\right|_{1-\alpha}^{\mathcal{F}\vee} \xrightarrow{p} |T|_{1-\alpha}^{\mathcal{F}\vee}$ by Theorem 9, and because $|T|^{\mathcal{F}\vee}$ has a continuous distribution.

Exercises

$\Downarrow$

Skills

$\Downarrow$

Competence

Problems

$\Downarrow$

Exploration

$\Downarrow$

Curiosity

Calendar magic

Outline any 3×3 square of dates in the calendar

8	9	10
15	16	17
22	23	24

Have Dr. Dave write down a number while you:

- Circle any of your nine numbers; cross out the others in its row and column
- Circle any remaining number; cross out the others in its row and column
- Add the remaining number to the two you circled. . . see if Dr. Dave divined your sum!

December 2025

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Example:

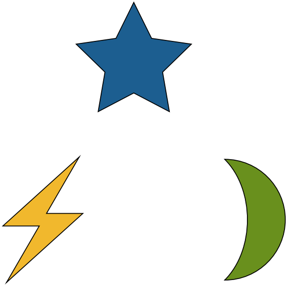
8	~~9~~	~~10~~
~~15~~	~~16~~	17
~~22~~	23	~~24~~

Sum = 48

Magic symbols

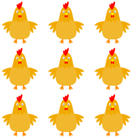
Quietly (don't tell Dr. Dave):

- Take the last 3 digits of your lunch # (like 842)
- Reverse the digits (like 248)
- Subtract the smaller from the larger (like $842 - 248 = 594$)
- Divide by three (like $594/3 = 198$)
- Sum the digits (like $1 + 9 + 8$)
- See if Dr. Dave can predict your symbol...!

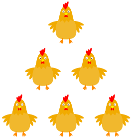


A square triangle?

Imagine you have some, uh, chickens: 

For certain numbers of chickens, you can arrange them into a square, like 

For others, you can arrange them into a triangle, like



$\implies$ Is there any number of chickens that you can arrange into both a square and a triangle??