Online Classes vs YouTube

Opportunities and Challenges Engaging a Global Audience

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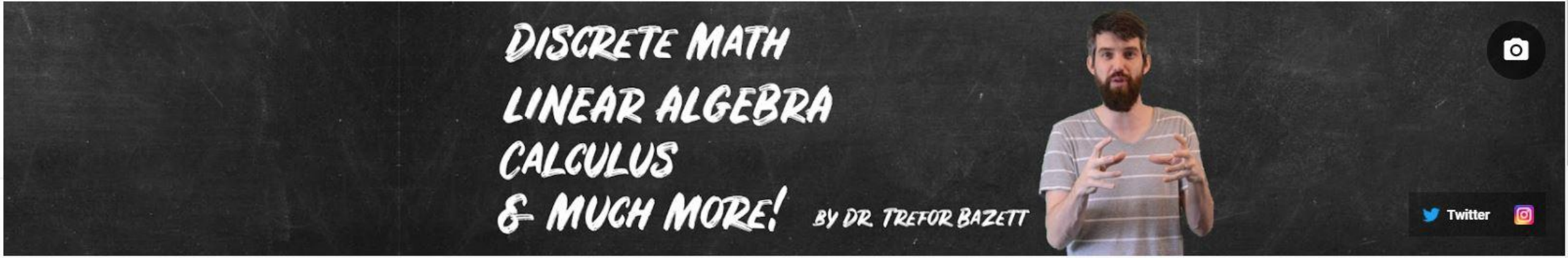
Where I started…

- 20 students
- Asynchronous
- Video Modules



Dr. Trefor Bazett

86.9K subscribers

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The MATH of Epidemics | Intro to the SIR Model

194,612 views • 11 months ago

How do organizations like the WHO and CDC do mathematical modelling to predict the growth of an epidemic? In this video we introduce the Susceptible- Infected-Recovered or SIR model. This is a simple system of differential equations that qualitatively behalves in a reasonable way. Studying this near the beginning gives a value called R_0 which governs the early growth rate which is exponential growth and is a standard

READ MORE

Discrete Math (Full Course: Sets, Logic, Proofs, Probability, Graph Theory, etc)

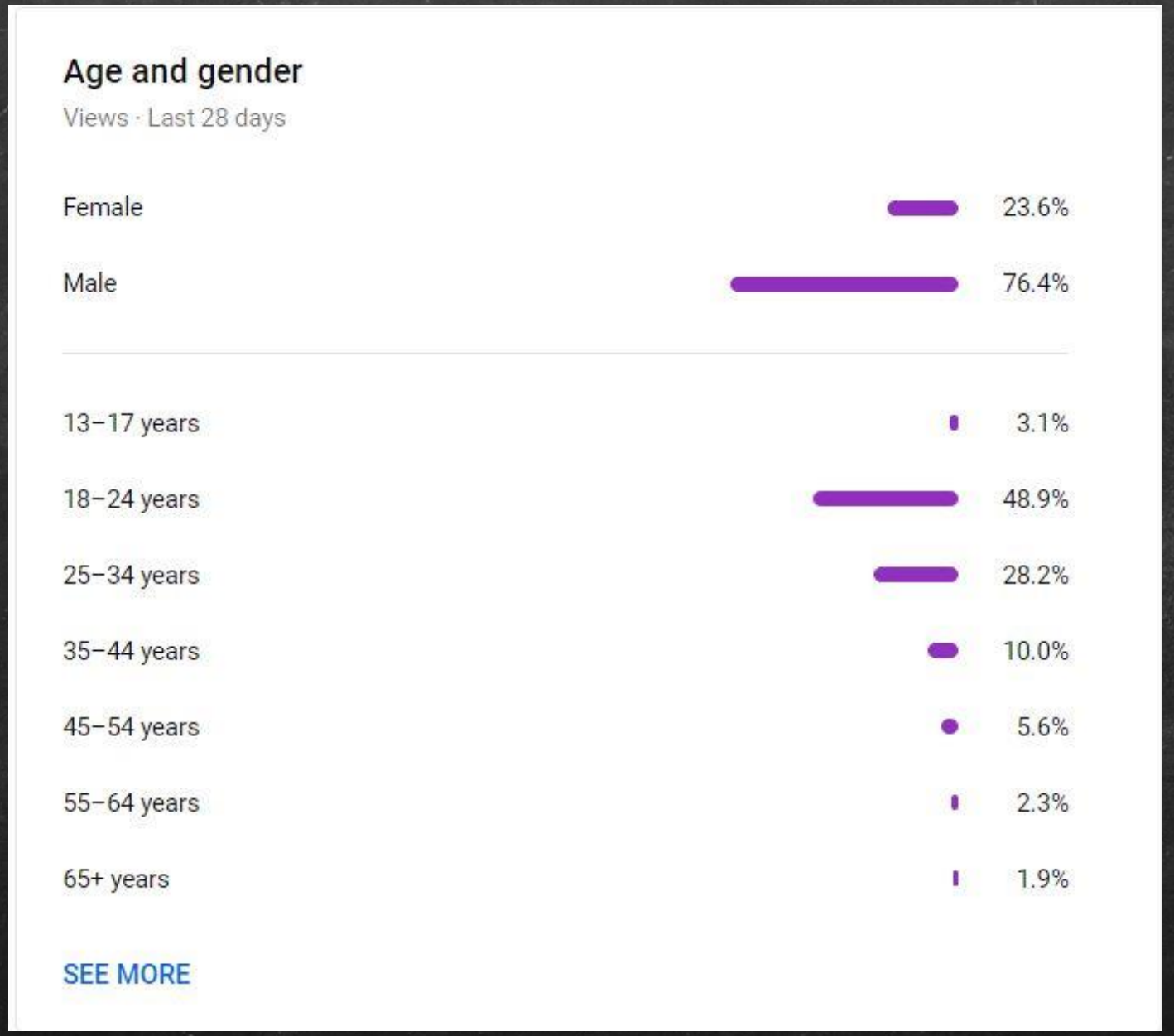
PLAY ALL

A one-semester course on Discrete Math taught by Dr. Trefor Bazett Covers: Logical Statements,

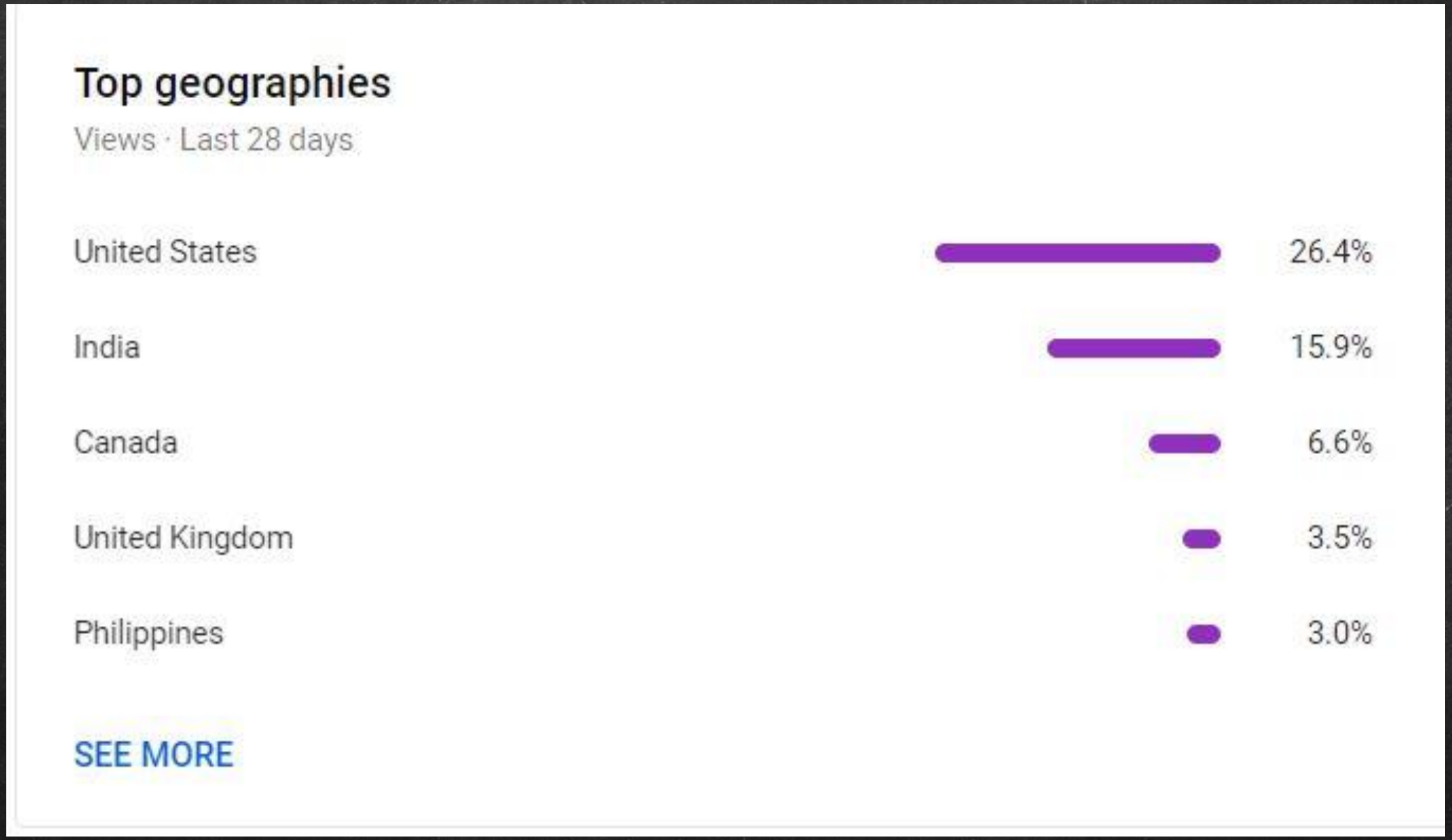
Where I ended up…

- 6 full courses, 500 videos
- Watched ~1000 hours per day

Who watches math YouTube?



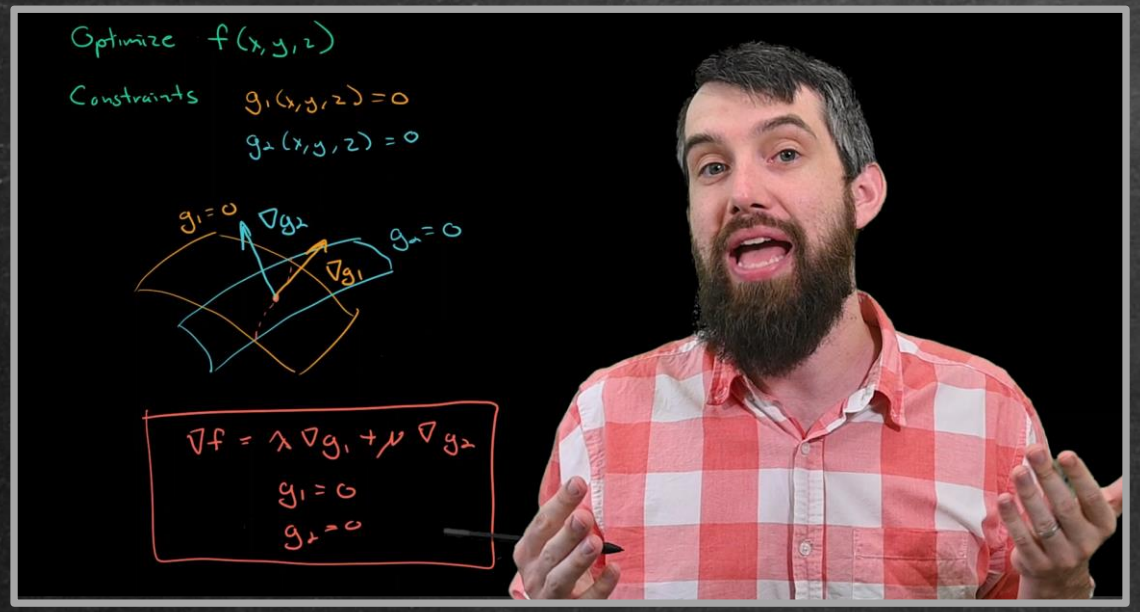
Who watches math YouTube?

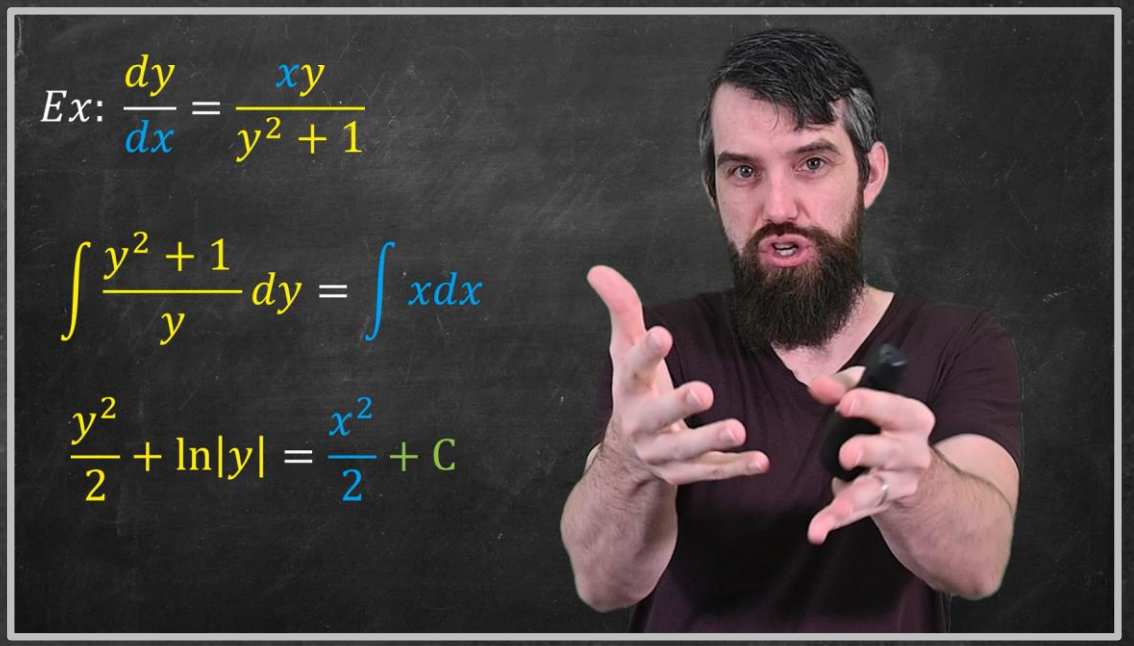


What the YouTube algorithm cares about

- Average View Duration (AVD)
  - Engaging
  - Useful

- Click Through Rate (CTR)
  - Titles/Thumbnails
  - Search


Optimize $f(x,y,z)$
Constraints $g_1(x,y,z)=0$
$g_2(x,y,z)=0$
$g_1=0$
∇g_2
$g_2=0$
∇g_1
$\nabla f = \lambda \nabla g_1 + \mu \nabla g_2$
$g_1=0$
$g_2=0$


$Ex: \frac{dy}{dx} = \frac{xy}{y^2+1}$
$\int \frac{y^2+1}{y} dy = \int x dx$
$\frac{y^2}{2} + \ln|y| = \frac{x^2}{2} + C$

Personalization Principle

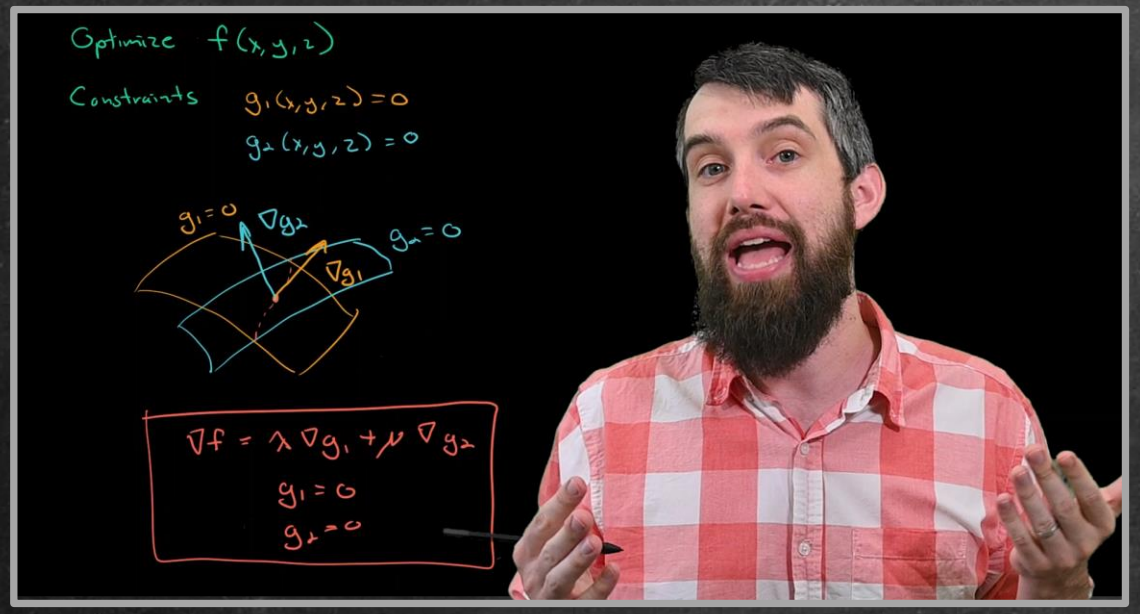
- Include your face?
- Conversational Tone
- Enthusiastic!

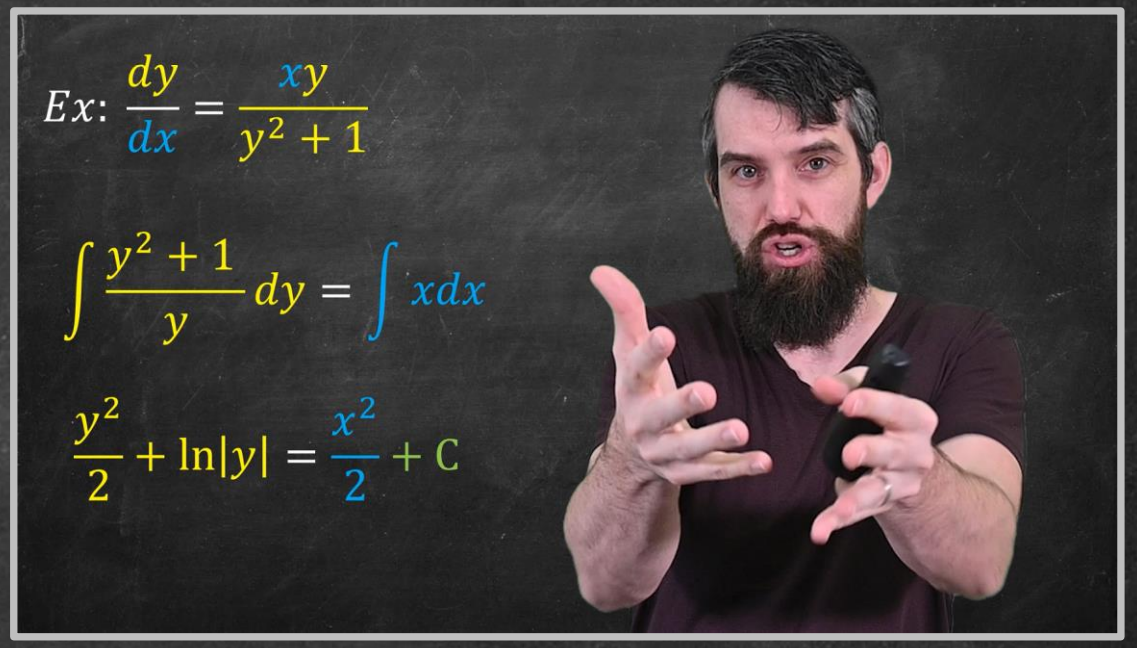
Guo PJ, Kim J, Robin R. L@S'14 Proceedings of the First ACM Conference on Learning at Scale. New York: ACM; 2014. How video production affects student engagement: an empirical study of MOOC videos; pp. 41–50.

Mayer RE. Applying the science of learning: evidence-based principles for the design of multimedia instruction. Cogn Instr. 2008;19:177–213.

Pacing:

- Adjust to Learning Objectives





Storytelling

Fact 1

and

Fact 2

and

Fact 3

Storytelling

Fact 1

but

Fact 2

therefore

Fact 3

Storytelling

Hook

but

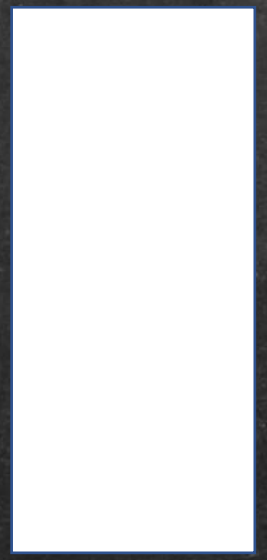
Tension

therefore

Resolution

Multimedia Principle:

vs



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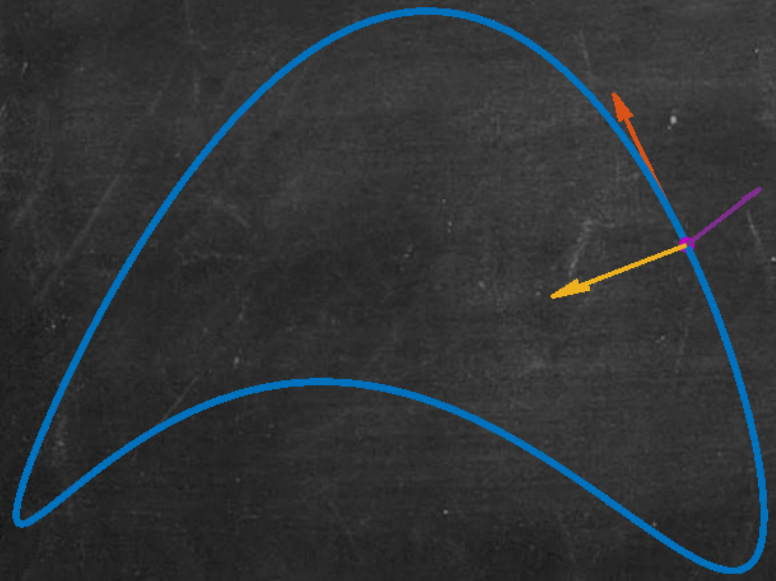
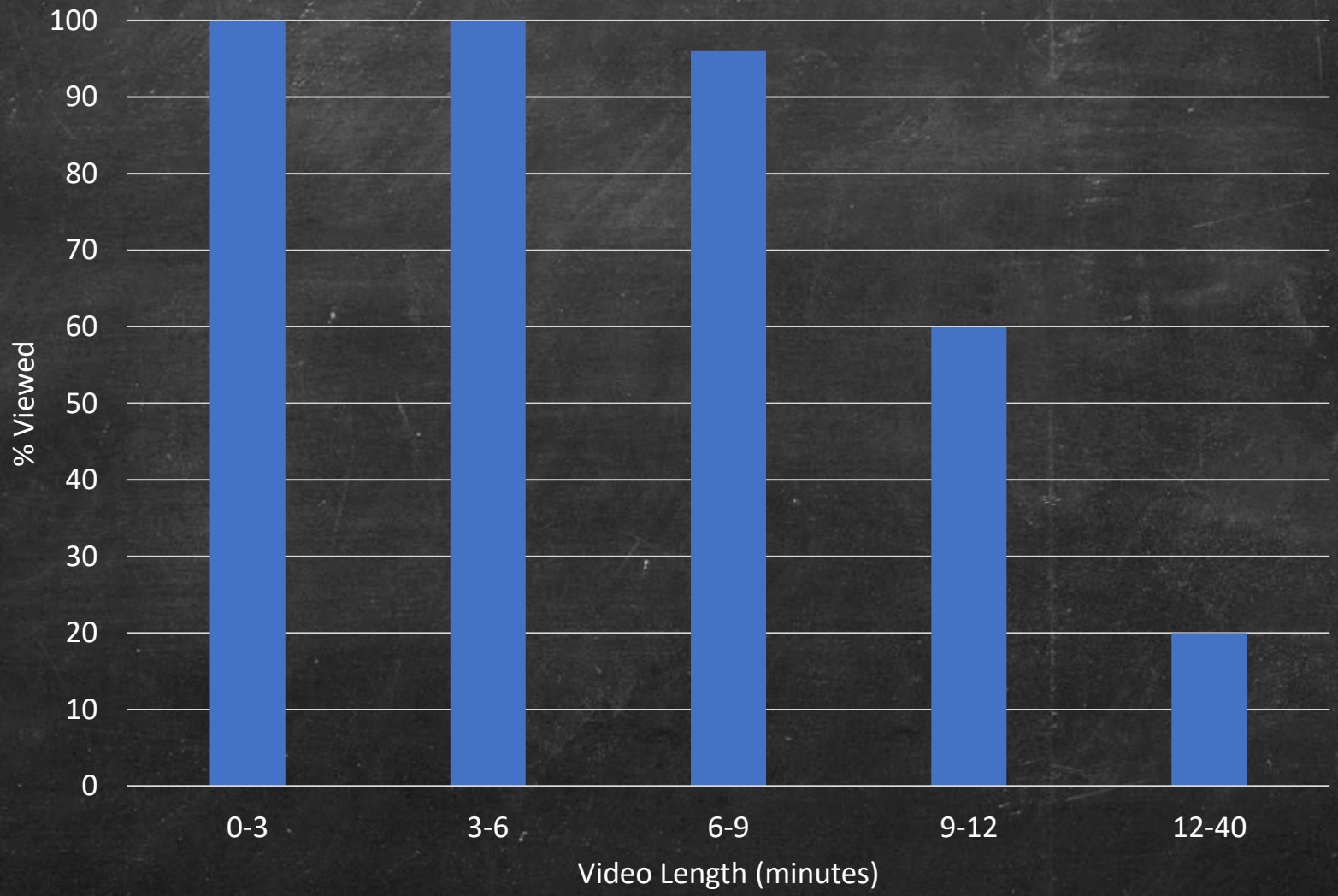


Segmenting: Keep it short!



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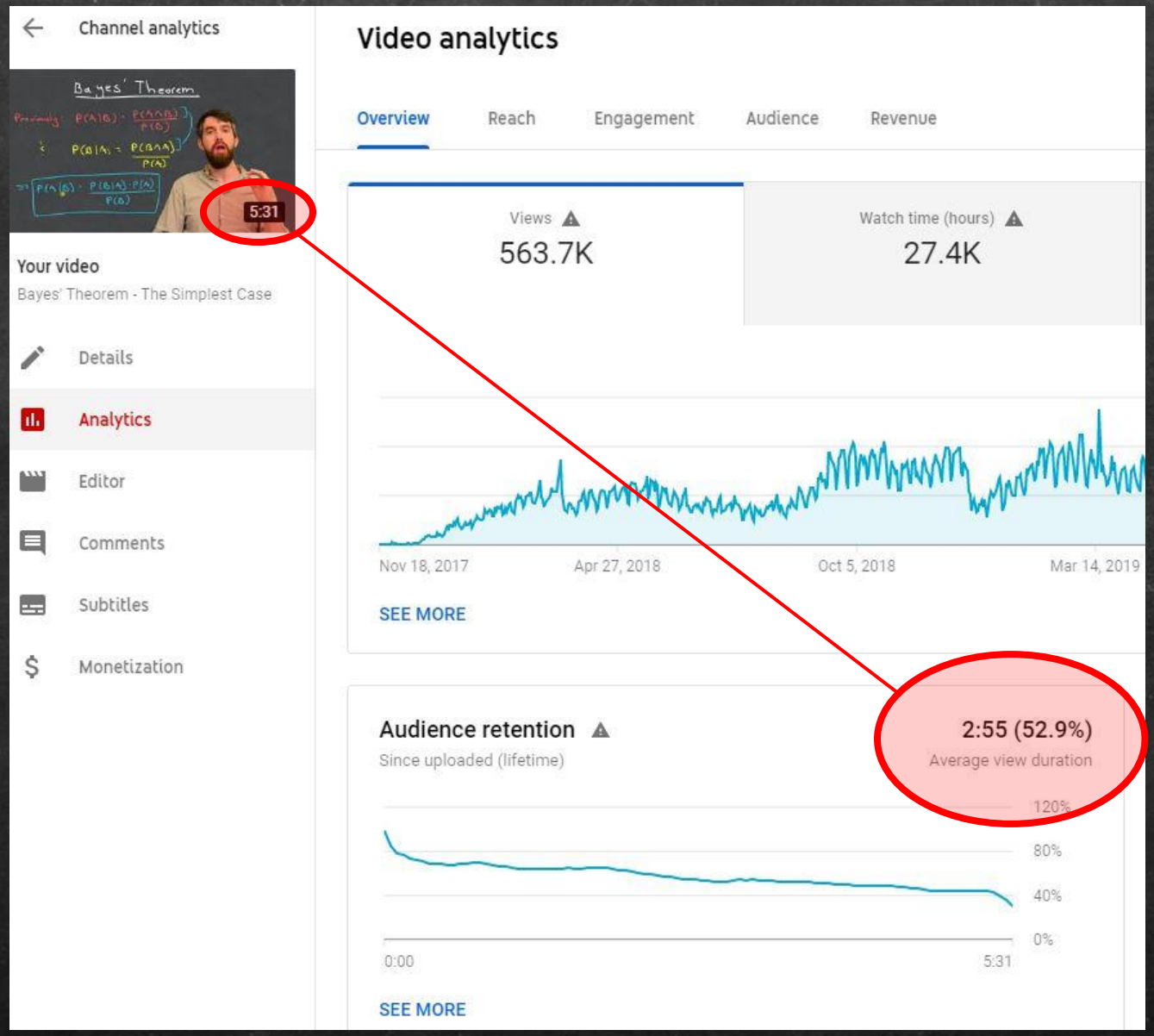
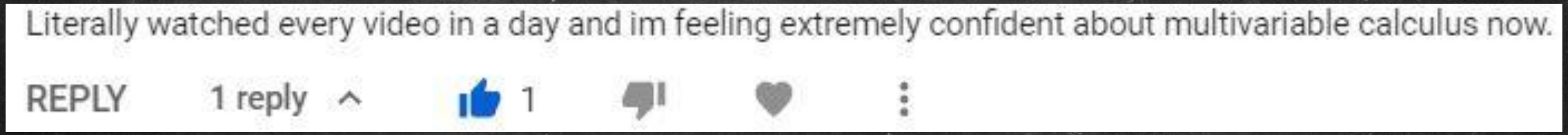


The biggest problem with YouTube??



The biggest problem with YouTube??

Minimal active learning

Cognitive Load:

Intrinsic Load

Extrinsic Load ↓

Germane Load ↑

Sweller J. Cognitive load during problem solving: effects on learning. Cogn Sci. 1988;12:257–285.

THANK YOU!!

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Tech behind the scenes:
bit.ly/trefortech