Welcome & Feedback

¶ 0.1



Questions & feedback are always welcome.

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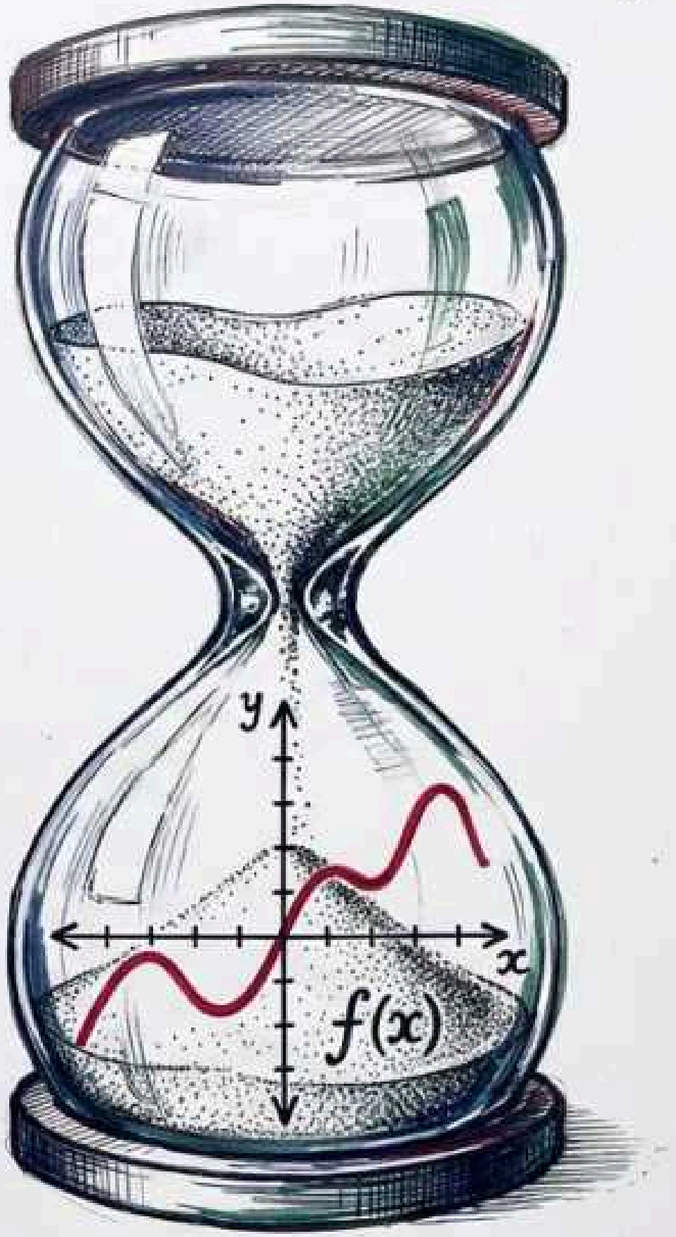
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Fundamentals of Mathematics: Precalculus



Brief

(Overview + 6 short lectures ≈ 1 hour total)



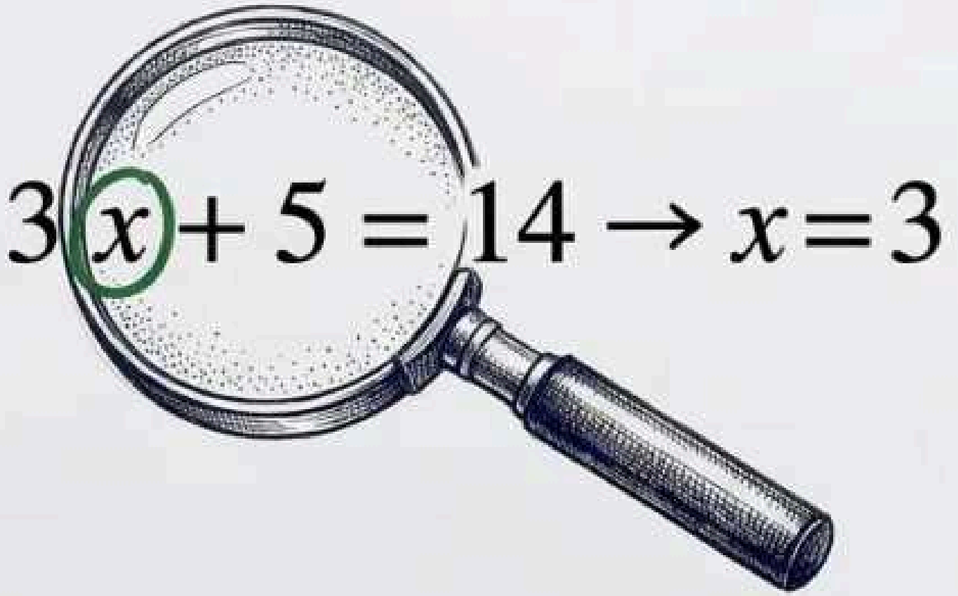
Core Goal: Read, graph, and combine the foundational functions of calculus.

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What is Precalculus?

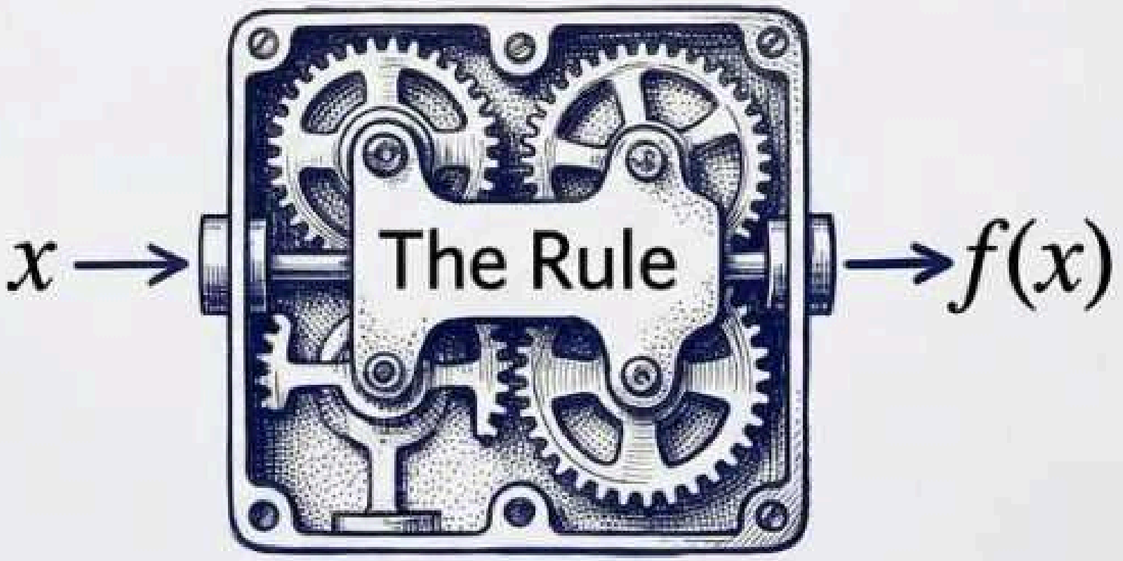
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Algebra



Solves for an unknown, static number.

Precalculus



Studies whole rules (Functions).

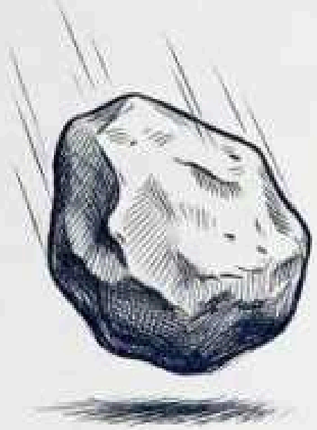
- **Definition:** A function is a rule turning each input into exactly one output.
- **Focus Areas:** Graph shapes, combinations, and behavior at extreme limits ($x \to \infty$, $x \to 0$).

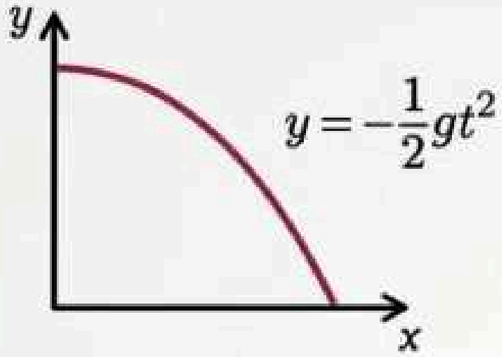
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The Language of Models: Why Learn It?

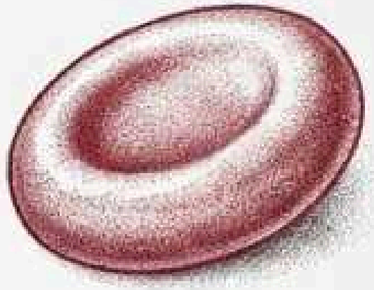
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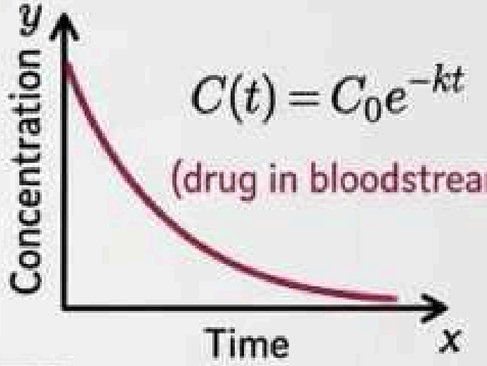
Physics/Engineering:





Medicine/Biology:



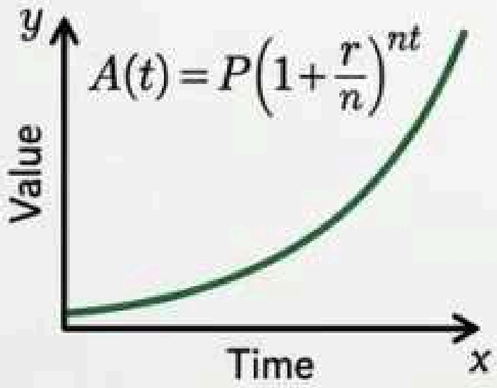


The Shared Language: Calculus, physics, engineering, economics, CS, and statistics all speak the language of functions.

The Superpower: Read and graph a function to see what a model predicts—and instantly notice when it is wrong.

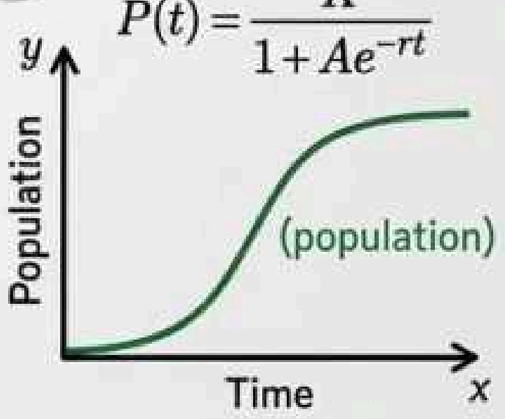
Economics:





Statistics:





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Prerequisites & Tools

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Required Base (Math 101 B):
Basic algebra, solving equations, fractions, exponents, and factoring.

Helpful Bonus (Math 110 B):
Trigonometry (Not required; this course concentrates purely on algebraic functions).



Required Tool:
A calculator or spreadsheet
(Crucial for Lecture 5: Exponentials & Logarithms).

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The Map: Six Lectures

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$y=mx+b$

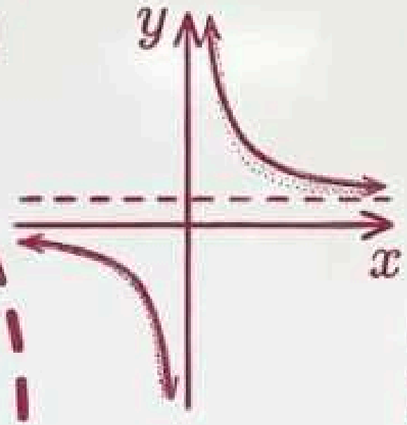
L1: Functions, domain, range, graphs (lines & parabolas).

$f(g(x))$

L2: Shifts, stretches, combinations, composition, inversions.

$y=x^3-2x$

L3: Polynomials.



$y=\frac{1}{x}$

L4: Rational functions & asymptotes.

e^x

$\ln(x)$

L5: Exponentials & logarithms.

$\lim_{x\to\infty}$

L6: Sequences, series, & limits. The door to calculus.

L6: Sequences, series, & limits. The door to calculus.

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How to Study This Course

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Do Not Just Watch:
Pause the video.
Try examples before the answer is revealed.

Verify Everything:
Check every answer by plugging it back into the original problem.

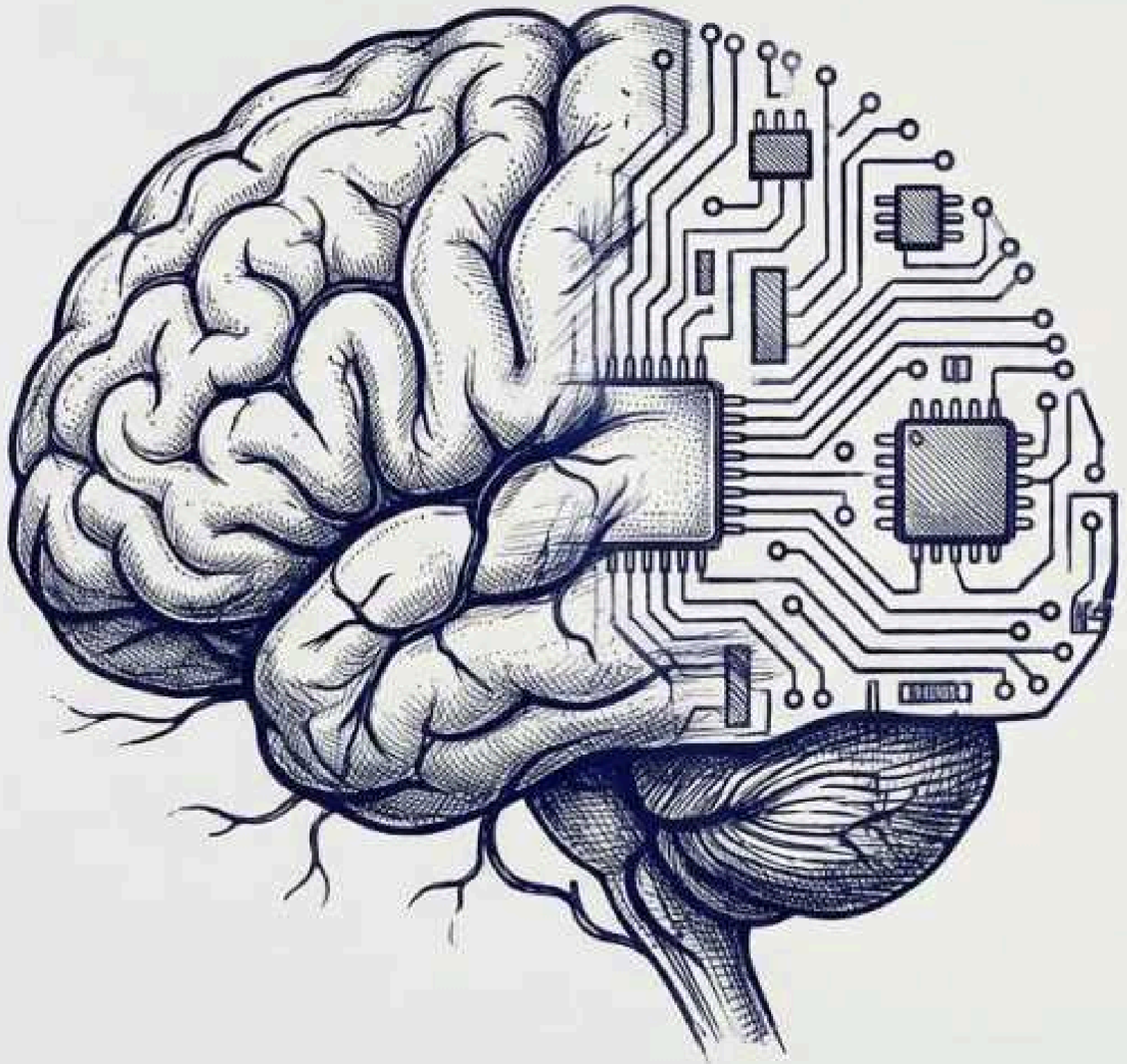


Draw to Remember:
Sketch graphs by hand.
Physical drawing locks shapes into memory.

Read Aloud:
Transcripts write out formulas in words.
Read them aloud to build fluency.

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Production, AI, & Accuracy



The Partnership: Developed with AI assistance, strictly under human teacher direction.

Verification: Every calculation rigorously checked via computer. Found a mistake? Please tell us.

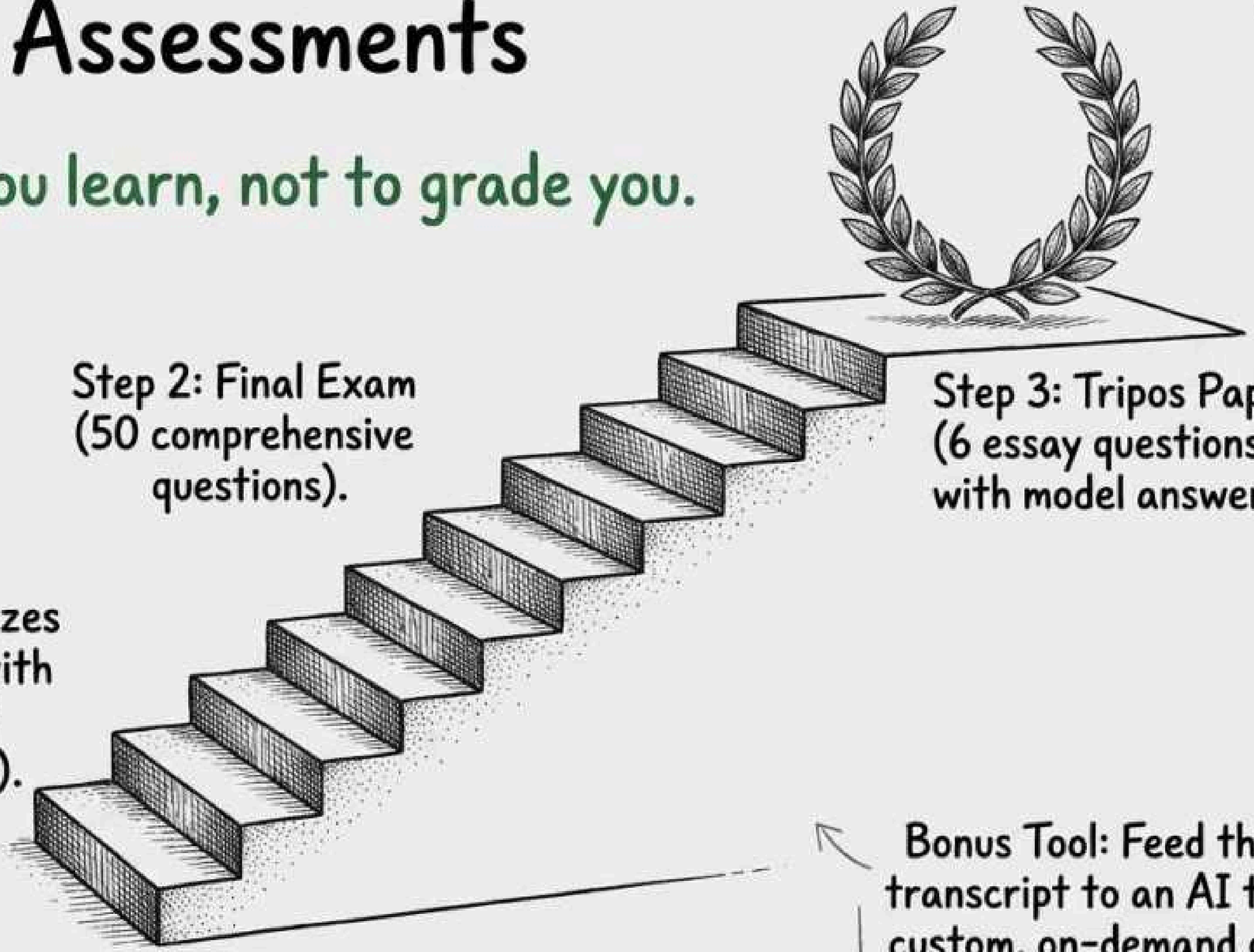
Navigation Note: Every paragraph is numbered (e.g., ¶ 4.6) for exact, easy reference. This is why you see ¶ 0.8 in the top corner of this slide.

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Formative Assessments

¶ 0.9

Goal: To help you learn, not to grade you.



Step 1: Lecture Quizzes (5 questions each, with with detailed explanatory keys).

Step 2: Final Exam (50 comprehensive questions).

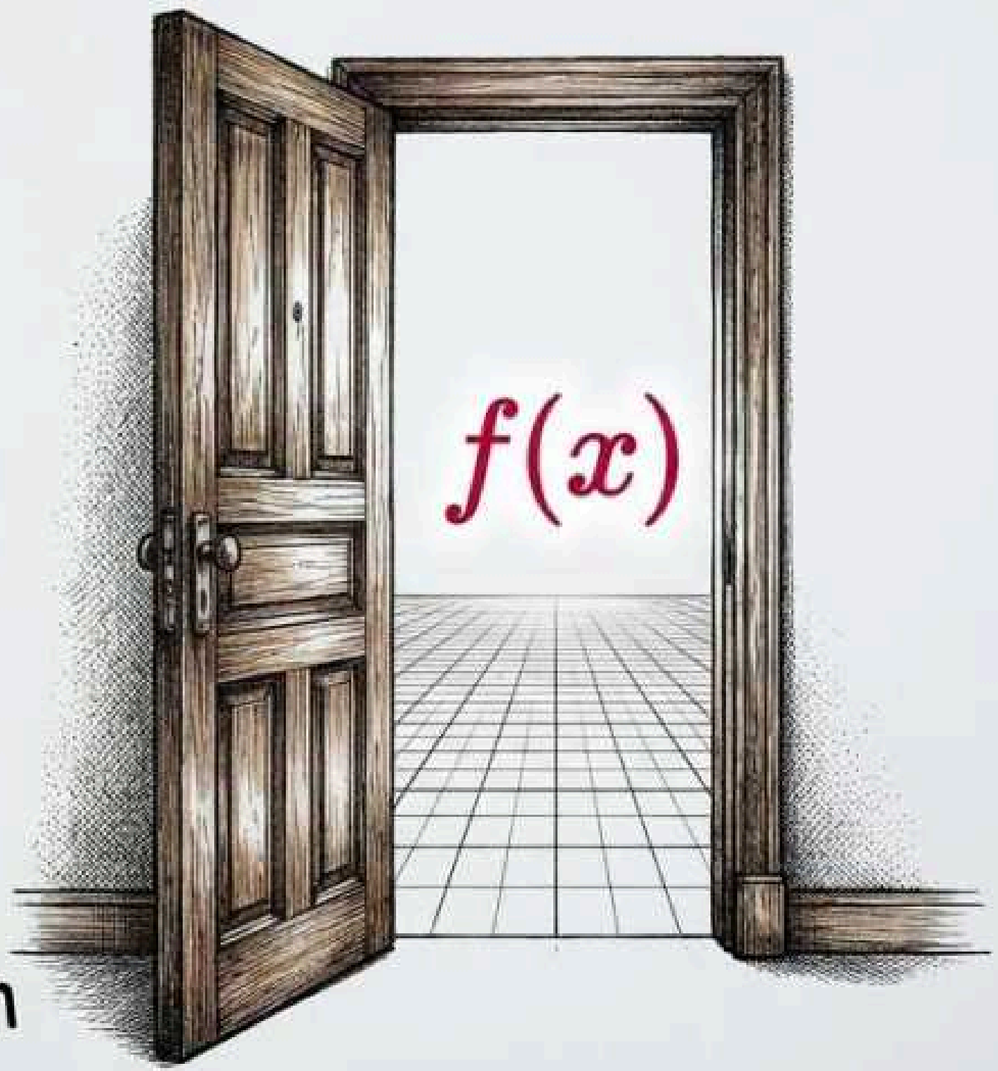
Step 3: Tripos Paper (6 essay questions paired with model answers).

Bonus Tool: Feed the course transcript to an AI tutor for custom, on-demand quizzing.

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Let Us Begin

¶ 0.10



Next Stop: Lecture 1
(Functions and their Graphs).

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