🧭 AP Calculus 8-Week Study Plan

Designed by Engin Savaş | AP Calculus AB/BC Expert & Author of *The Ripple Effect*

"Don't rush to finish topics — aim to connect them."
This plan transforms content review into conceptual mastery — every week builds a deeper understanding of calculus as a language of change.

🗓️ OVERVIEW

Duration	8 Weeks (AB: 7 Units + Review | BC: 9 Units + Review)
Study Time	AB → 45 min/day · BC → 60 min/day
Cycle	5 Study Days + 1 Flex & Mastery Day + 1 Reflection Day
Goal	Build layered understanding of Limits → Derivatives → Integrals → FRQs through progressive recall and application.

🗓️ WEEK-BY-WEEK BREAKDOWN

WEEK 1 — Limits & Continuity

- **Concept Focus:** Limit laws, indeterminate forms, continuity, IVT.
- **Practice:** Graph-based reasoning & epsilon–delta intuition.
- **Mini-Reflection:** "Explain continuity in your own words."
- **Recommended Resources:**
  - *The Ripple Effect* p.15–30
  - Khan Academy "Limits and Continuity"
- **Flex Task Option:** Create one real-world example of a discontinuity (piecewise function).

WEEK 2 — Derivatives I (Basics & Rules)

- **Focus:** Power, Product, Quotient, Chain Rules; Implicit differentiation.
- **Application:** Velocity, slope, rate of change in motion models.
- **Checkpoint Quiz #1:** 10 mixed questions, no calculator.
- **Self-Eval:** "I can explain why the derivative represents instantaneous rate." (1–5)

- **FRQ Practice:** 1 short derivative-based justification problem.

WEEK 3 — Derivatives II (Applications & MVT)

- **Focus:** Monotonicity, extrema, MVT, concavity, optimization.
- **FRQ Integration:** Justify extrema using sign charts.
- **Mini-Lab:** Desmos graphing of f, f', f'' to visualize change.
- **Flex & Mastery Day Options:**
    - (A) Retry hardest optimization problem from Week 2.
    - (B) Complete Desmos Tangent Line Lab.
    - (C) Solve "Challenge Set 1" (3 AP-level questions).
- **Recommended:** *The Ripple Effect* p.55–70

WEEK 4 — Integrals I (Fundamentals & Area)

- **Focus:** FTC I & II, Riemann sums, accumulation functions.
- **BC Add-On:** Intro to Polar Coordinates.
- **Activity:** Sketch f' from f and approximate net change.
- **Checkpoint Quiz #2:** Integration basics + graph interpretation.
- **Self-Eval:** "Can I explain why the definite integral represents total change?"

WEEK 5 — Integrals II (Applications & Differential Equations)

- **Focus:** Volumes (disk/washer/shell), average value, separable DEs.
- **BC Add-On:** Parametric equations & velocity vectors.
- **FRQ Integration:** One volume FRQ + one DE FRQ justification.
- **Motivation:** "Integration connects accumulation to prediction."

WEEK 6 — FRQ Strategy & Calculator Mastery

- **Focus:**
    - TI-84 vs Desmos skills: nDeriv, fnInt, Solver, regression

- FRQ rubric writing drills ("Since f'(x) changes from + to –...")
- Time Management Simulation (25-min section)

- **Recommended Resources:**
  - College Board FRQ Bank
  - *The Ripple Effect* → FRQ Strategy Checklist
- **Self-Eval:** "How confident am I in explaining *why* an answer is correct?" (1–5)

WEEK 7 — BC Extensions (Series, Parametric, Polar, Vector)

- **Focus:** Convergence tests (Ratio, p-Series, Alternating).
- **Visual Lab:** Polar area exploration ($\frac{1}{2}\int r^2\, d\theta$).
- **FRQ Challenge:** Taylor polynomial approximation question.
- **Flex & Mastery Day:** "Series Convergence Challenge" (timed 15 min).

WEEK 8 — Comprehensive Review & Simulation

- **Day 1–3:** Mixed MCQ tests (No Calc + Calc).
- **Day 4–5:** 2 FRQ simulations (self-graded with rubric).
- **Day 6:** "Formula Recall Race" – timed self-test.
- **Day 7:** Reflection & Mind Map summary:
  - What's my strongest unit?
  - Which FRQ type still feels unclear?
- **QR Code:** Link to "Mathigh FRQ Strategy Room" for targeted review.

🧩 **FLEX & MASTERY DAY (Biweekly)**

Choose one:

1. Review your most missed Checkpoint Quiz question.
2. Complete a Desmos skill lab (calculator simulation).
3. Attempt a mini "Challenge Set" (3 high-level problems).
4. Record a 1-minute video explaining a concept — teaching = mastering.

📈 EVALUATION STRUCTURE

- **Checkpoint Quizzes:** Weeks 3, 5, 7
- **Self-Evaluations:** Confidence Scale (1–5) each week
- **Reflection Prompts:** Conceptual understanding > memorization
- **Rubric Readiness:** Every 2 weeks, one FRQ with self-scoring rubric

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🧠 MINDSET MANTRA

“The FRQ doesn’t test your memory — it tests your ability to reason mathematically.”
Use *Claim → Reason → Evidence* logic in every explanation.

📚 RESOURCE INDEX (for inclusion in PDF footer)

- *The Ripple Effect* (Engin Savaş, Mathigh)
- Khan Academy AP Calculus AB/BC Course
- College Board AP Classroom + FRQ Bank
- Mathigh.com – Free Concept Quizzes & Formula Sheets