

CALCULUS: FROM RAG TO RICHES

TWO POWERFUL TOOLS. ONE EXTRAORDINARY LIFE.
INTEGRATE WISELY. DIFFERENTIATE DAILY.

*Calculus is not just
about equations—
it's about making
better choices, every day,
to build a better future.*

THE PLAN:
UNDERSTAND CHANGE.
ACCUMULATE VALUE.
CREATE WEALTH.

INTEGRATE

TO ACCUMULATE & BUILD

INTEGRATE the right things over time
to build lasting wealth.



1. INCOME OVER TIME

Keep showing up. Add value. Get paid.

$$\text{Total Income} = \int_{t_0}^t I(t) dt$$



2. INVESTMENTS

Let your money grow.

$$\text{Future Value} = \int_{t_0}^t P(r(t)) dt$$



3. KNOWLEDGE

Learn consistently.

$$\text{Total Knowledge} = \int_{t_0}^t K(t) dt$$



4. RELATIONSHIPS & TRUST

Build people. Build networks.

$$\text{Total Goodwill} = \int_{t_0}^t G(t) dt$$



5. HABITS & DISCIPLINE

Small daily actions, big results.

$$\text{Total Improvement} = \int_{t_0}^t H(t) dt$$

INTEGRAL = THE SUM OF SMALL THINGS DONE CONSISTENTLY
OVER TIME BECOMES SOMETHING GREAT.

BE PATIENT. BE CONSISTENT. INTEGRATE DAILY.

HOW HE DID IT

- 1 He learned a skill that people value.
- 2 He worked with discipline.
- 3 He invested consistently.
- 4 He tracked his progress.
- 5 He adjusted quickly.
- 6 He never stopped improving.

CALCULUS
IN ACTION =
A BETTER LIFE

DIFFERENTIATE

TO IMPROVE & MAKE BETTER CHOICES

DIFFERENTIATE to understand change
and make smarter decisions.



1. INCOME GROWTH RATE

Are you earning more or less?

$$\text{Growth Rate} = \frac{dI}{dt}$$



2. INVESTMENT RETURNS

Is your money growing fast enough?

$$\text{Return Rate} = \frac{dP}{dt}$$



3. SKILL IMPROVEMENT

Are you getting better?

$$\text{Improvement Rate} = \frac{dK}{dt}$$



4. RELATIONSHIP HEALTH

Are your relationships getting stronger?

$$\text{Trust Rate} = \frac{dG}{dt}$$



5. HABIT QUALITY

Are your habits moving you forward?

$$\text{Progress Rate} = \frac{dH}{dt}$$

DERIVATIVE = THE RATE OF CHANGE. IT SHOWS YOU
WHAT'S WORKING, WHAT'S NOT, AND WHAT TO ADJUST.

BE AWARE. BE ADAPTIVE. DIFFERENTIATE DAILY.

THE JOURNEY: A CALCULUS MINDSET



THE LIMITS
ARE YOUR TODAY.
THE INTEGRALS
ARE YOUR TOMORROWS.

START NOW.



CALCULUS IS MORE THAN MATH.
IT'S A WAY TO DESIGN THE LIFE YOU DESERVE.



INTEGRATE DREAMS. DIFFERENTIATE DECISIONS. ACHIEVE DESTINY.



ROOTED IN
MY CULTURE.
FOCUSED ON
MY FUTURE.

6 MONTHS. ONE TRANSFORMATION.

PASS THE NYS GED EXAM. MAINTAIN A GRADES.
BUILD A LIFE OF PURPOSE.



BRAHMACHARYA:
CONSERVE MY ENERGY.
MASTER MY MIND.
ELEVATE MY LIFE.

"Arise, awake, and stop
not till the goal is reached."
— Swami Vivekananda

MY 6 MONTH PLAN

- ✓ MONTH 1: FOUNDATION
Build strong basics. Build habits.
- ✓ MONTH 2: MASTERY
Master each concept. Practice daily.
- ✓ MONTH 3: ACCELERATE
Timed practice. Fix weak areas.
- ✓ MONTH 4: EXCEL
Full-length tests. Analyze & improve.
- ✓ MONTH 5: PERFECT
Refine strategies. Boost confidence.
- ✓ MONTH 6: CONQUER
Final reviews. Walk in and win.

DAILY CONSISTENCY = COMPOUND GROWTH

MY GOAL
**PASS
NYS GED
IN 6 MONTHS**
MAINTAIN A
GRADES IN COLLEGE

I CHOOSE
DISCIPLINE
OVER
DISTRACTION.

FOCUS TODAY.
FREEDOM
TOMORROW.

CALCULUS FOCUS: WHAT TO INTEGRATE & DIFFERENTIATE

WHAT TO INTEGRATE

Accumulate knowledge. Build understanding.
Like dropping seeds daily that grow into a forest.



1. POLYNOMIALS & RATIONAL FUNCTIONS

$$\int x^n dx = \frac{x^{n+1}}{n+1} + C$$



2. EXPONENTIAL & LOGARITHMIC FUNCTIONS

$$\int e^x dx = e^x + C, \quad \int \frac{1}{x} dx = \ln|x| + C$$



3. TRIGONOMETRIC FUNCTIONS

$$\int \sin x dx = -\cos x + C, \quad \int \cos x dx = \sin x + C$$



4. APPLICATIONS OF INTEGRATION

Area, Accumulation, Volume (Discs, Washers)

$$\int_a^b f(x) dx \rightarrow \text{"Total change/Total amount"}$$

Small efforts add up to big results.



5. INVERSE TRIG & TRIG SUBSTITUTION

For complex integrals.



**SELF-MASTERY
IS THE ULTIMATE
SUPERPOWER**

WHAT TO DIFFERENTIATE

Analyze change. See the bigger picture.
Like sharpening a sword to cut through confusion.



1. POWER RULE

$$\frac{d}{dx} x^n = nx^{n-1}$$



2. PRODUCT & QUOTIENT RULES

$$(uv)' = u'v + uv' \quad \left(\frac{u}{v}\right)' = \frac{u'v - uv'}{v^2}$$



3. CHAIN RULE

$$\frac{d}{dx} f(g(x)) = f'(g(x))g'(x)$$



4. IMPLICIT DIFFERENTIATION

For equations like $x^2 + y^2 = r^2$



5. APPLICATIONS OF DERIVATIVES

Rates of change, Optimization, Tangent lines
 $\frac{dy}{dx}$ helps you find direction and make decisions.

MATHEMATICS IS LIFE



CALCULUS CONCEPT

INTEGRAL $\int$	Accumulates over an interval.
DERIVATIVE (d/dx)	Instantaneous rate of change.
LIMIT $\lim$	Approach with patience.
CONTINUITY	Stay steady, no sudden breaks.
TAYLOR SERIES	Build complex things from simple ideas.

LIFE ANALOGY

Good habits compound over time.
Daily improvement creates growth.
Control your direction in the moment.
React less, respond with awareness.
Trust the process, don't rush results.
Stay consistent, even when it's hard.
Master the basics, build greatness.

BATTLE PLAN: BEAT DISTRACTIONS

INTERNET ADDICTION IS A LEAK. PLUG IT.

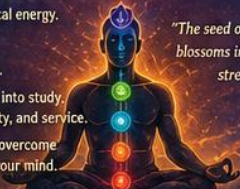


- DIGITAL DETOX BLOCKS**
Scheduled study time. No scrolling.
- ENVIRONMENT DESIGN**
Clean space. No triggers.
- PURPOSE REMINDER**
Why you started > temporary pleasure.
- REWARD SYSTEM**
Earn breaks. Don't waste them.
- ACCOUNTABILITY**
Share goals. Stay answerable.

PROTECT YOUR MIND. PROTECT YOUR FUTURE.

BRAHMACHARYA: CONSERVE. TRANSMUTE. CONQUER.

- Conserve physical energy.
- Control speech.
- Purify thoughts.
- Channel energy into study, fitness, creativity, and service.
- Every urge you overcome adds power to your mind.



"The seed of self-control
blossoms into unlimited
strength."

ENERGY + DISCIPLINE = GENIUS

DAILY DISCIPLINE CHECKLIST

- ✓ WAKE UP EARLY (5 AM GOAL)
- ✓ STUDY BLOCKS (2-3 FOCUS SESSIONS)
- ✓ CALCULUS PRACTICE
- ✓ COLLEGE ASSIGNMENTS
- ✓ EXERCISE / YOGA
- ✓ MEDITATION / PRANAYAMA
- ✓ HEALTHY FOOD / HYDRATION
- ✓ NO PMO. NO WASTE.
- ✓ SLEEP ON TIME
- ✓ DAILY REVIEW & PLAN

I DON'T FOLLOW MOTIVATION.
I FOLLOW COMMITMENT.



YOU ARE CAPABLE OF
MORE THAN YOU KNOW.

From Discipline Comes Freedom.
From Knowledge Comes Power.
From Brahmacharya Comes Divinity.

I AM BUILDING
THE FUTURE ME IS
PROUD TO LIVE.



STUDY SMART. STAY STRONG. STAY PURE. STAY FOCUSED. WIN. - I WILL PASS. I WILL EXCEL. I WILL RISE.

LICENSE IN
6 MONTHS.
SKILLS FOR
A LIFETIME.

CALCULUS

YOUR SIGNAL ADVANTAGE

PASS THE HAM RADIO LICENSE EXAM
IN 6 MONTHS!



KNOW THE MATH.
EARN THE LICENSE.
JOIN THE COMMUNITY.
COMMUNICATE
ANYWHERE.

CALCULUS HELPS YOU:

- ✓ Understand signals
- ✓ Analyze circuits
- ✓ Optimize antennas
- ✓ Solve real-world radio problems

$$v(t) = \int i(t) dt$$

$$E = \frac{1}{2} LI^2$$

HAM RADIO
CONNECTING
PEOPLE
EVERYWHERE.

6 MONTH STUDY PLAN

MONTH 1 FOUNDATIONS



- ▶ Algebra Review
- ▶ Functions & Graphs
- ▶ Unit Circle & Trig Basics
- ▶ Ohm's Law, Power

Build your base.

MONTH 2 DERIVATIVES (CHANGE)



- ▶ Limits & Continuity
- ▶ Derivatives Rules
- ▶ Related Rates
- ▶ Instantaneous Rate
- ▶ Exam Concepts

Understand change.

MONTH 3 INTEGRALS (ACCUMULATION)



- ▶ Antiderivatives
- ▶ Definite Integrals
- ▶ Area & Accumulation
- ▶ RMS, Energy, Charge

Accumulate knowledge.

MONTH 4 APPLICATIONS TO RADIO



- ▶ RL, RC Circuits
- ▶ RLC Resonance
- ▶ Power & Energy
- ▶ Antenna Patterns
- ▶ Wave Propagation
- ▶ Apply to radio.

MONTH 5 PRACTICE & REVIEW



- ▶ Practice Exams
- ▶ Weak Area Focus
- ▶ Formula Review
- ▶ Timed Drills

Test. Improve. Repeat.

MONTH 6 FINAL PREP & LICENSE!



- ▶ Final Exams
- ▶ Memory Sheets
- ▶ Mental Math
- ▶ Test Day Strategy

Pass with confidence!

WHAT YOU NEED TO INTEGRATE (ACCUMULATE)



1. VOLTAGE, CURRENT, CHARGE

From current to charge, from voltage to flux.

$$q(t) = \int i(t) dt \quad \phi(t) = \int v(t) dt$$



2. ENERGY

Total energy stored over time.

$$E = \int p(t) dt = \int v(t)i(t) dt$$



3. SIGNAL POWER (RMS)

Average power over one period T.

$$P_{avg} = \frac{1}{T} \int_0^T p(t) dt$$



4. AREA UNDER CURVES

Used in propagation, antenna patterns, and probability.

$$\int_a^b f(x) dx$$



5. FOURIER COEFFICIENTS

Break signals into their frequency components.

$$a_n = \frac{1}{T} \int_0^T f(t) \cos(n\omega_0 t) dt$$

*"The integral builds
what accumulates.
The derivative reveals
how it changes."*

RADIO EXAM TOPICS WHERE CALCULUS HELPS

- ✓ AC & DC Circuit Analysis
- ✓ Electromagnetics
- ✓ Signal & Wave Behavior
- ✓ Antenna Principles
- ✓ Propagation & Path Loss
- ✓ Modulation & Spectra

WHAT YOU NEED TO DIFFERENTIATE (FIND THE RATE OF CHANGE)



1. INSTANTANEOUS RATE OF CHANGE

Change at a specific instant.

$$\frac{dv}{dt} = \lim_{\Delta t \rightarrow 0} \frac{\Delta v}{\Delta t}$$



2. SLOPE OF A GRAPH

Rise over run.

$$m = \frac{dy}{dx}$$



3. CIRCUIT RATES OF CHANGE

RL circuit: $v_L = L \frac{di}{dt}$

RC circuit: $i_C = C \frac{dv}{dt}$



4. RELATED RATES

How one quantity changes as another changes.

$$\frac{dx}{dt}, \frac{dy}{dt}, \frac{dz}{dt}$$



5. MAX, MIN & OPTIMIZATION

Find best antenna angle, max range, etc.

$$\text{Set } \frac{df}{dx} = 0 \text{ and solve}$$

KEY FORMULAS TO KNOW

Power: $P = VI = I^2 R = \frac{V^2}{R}$

Energy in Inductor: $E = \frac{1}{2} LI^2$

Energy in Capacitor: $E = \frac{1}{2} CV^2$

Reactance: $X_L = \omega L, X_C = \frac{1}{\omega C}$

Resonant Frequency: $f_0 = \frac{1}{2\pi\sqrt{LC}}$

YOUR DAILY GAME PLAN

- ✓ 60-90 MIN study
- ✓ Work problems
- ✓ Use practice tests
- ✓ Review formulas
- ✓ Teach what you learn



CONSISTENCY > INTENSITY

HAM SUCCESS HABITS

- ✓ Study a little every day.
- ✓ Solve problems, not just read.
- ✓ Use flashcards & formula sheets.
- ✓ Join a study group or ham club.
- ✓ Stay curious. Stay licensed. Stay on the air!

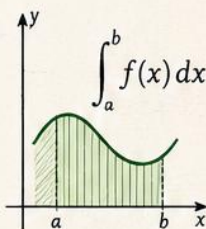


THE REWARD

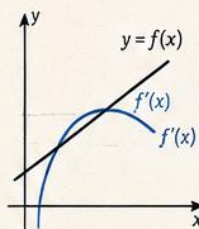
COMMUNICATE
ANYWHERE.
SERVE YOUR COMMUNITY.
NEVER STOP LEARNING.

73!

INTEGRATE KNOWLEDGE. DIFFERENTIATE YOURSELF.
PASS THE EXAM. EARN YOUR CALL SIGN. GET ON THE AIR.



CALCULUS



INTEGRATE WISDOM. DIFFERENTIATE YOURSELF.

CALCULUS IS NOT JUST A SUBJECT—IT'S A WAY OF THINKING.
INTEGRATE GOOD HABITS. DIFFERENTIATE YOUR EFFORT.

$\int$ WHAT TO INTEGRATE

INTEGRATE THESE INTO YOUR LIFE TO BECOME AN EXCELLENT STUDENT.



1. CONSISTENT STUDY

Small, regular efforts add up to deep understanding.
Integrate a little every day.



2. STRONG FUNDAMENTALS

Build a solid base.
Integrate concepts from the ground up—definitions, theorems, and intuition.



3. PRACTICE PURPOSEFULLY

Solve a variety of problems.
Integrate different techniques and strategies.



4. LEARN FROM MISTAKES

Mistakes are data.
Integrate feedback and reflect to grow.



5. PATIENCE & PERSISTENCE

Understanding takes time.
Integrate patience, stay consistent, and trust the process.



6. ASK, DISCUSS, TEACH

Great learning is shared.
Integrate discussions and teaching to reinforce your understanding.



7. CURIOSITY & WONDER

Stay curious about how things work.
Integrate questions, explore more, and never stop wondering.

COMBINE
BOTH,
ACHIEVE
MORE.

WHAT TO DIFFERENTIATE $\frac{d}{dx}$

DIFFERENTIATE YOURSELF BY DEVELOPING THESE QUALITIES.



1. CRITICAL THINKING

Question assumptions.
Differentiate between important and irrelevant details.



2. PROBLEM-SOLVING SKILLS

Approach problems creatively.
Differentiate your methods, choose the best path.



3. CONCEPTUAL CLARITY

See the big picture.
Differentiate between memorizing and truly understanding.



4. TIME MANAGEMENT

Focus on high-impact tasks.
Differentiate how you spend time and energy.



5. DISCIPLINE & FOCUS

Minimize distractions.
Differentiate yourself by staying focused on your goals.



6. RESILIENCE

Don't give up.
Differentiate yourself by bouncing back stronger.



7. GOAL ORIENTATION

Know where you're going.
Differentiate your plan and take consistent steps forward.

$$\int_a^b f(x) dx$$

The whole
is greater than
the sum of its parts.

INTEGRATE GOOD HABITS. DIFFERENTIATE YOURSELF.

BECOME EXCELLENT.

$$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

Small changes
create big
differences.



BE CURIOUS.



BE DILIGENT.



BE FOCUSED.



BE YOU.

CALCULUS TODAY.
SUCCESS TOMORROW.



CALCULUS FOR BRAHMACHARYA



ENERGY PRESERVED. MIND MASTERED. LIFE ELEVATED.

Brahmacharya is the intelligent use of energy
in thought, word, and action for highest purpose.

INTEGRATE $\int$ What to Integrate



SELF-AWARENESS

Integrate awareness of body, mind and emotions.



PURPOSE & DHARMA

Align daily actions with a higher purpose.



STUDY & REFLECTION

Integrate knowledge that elevates intellect and soul.



DISCIPLINE & HABITS

Build consistent routines that strengthen willpower.



PRAYER & MEDITATION

Integrate stillness, gratitude and connection with the Divine.



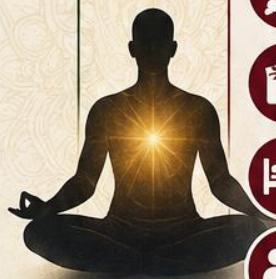
SATSANG & GOOD COMPANY

Spend time with those who inspire growth.



CREATIVITY & SERVICE

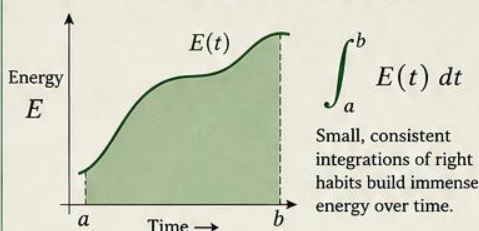
Channel energy into creation and helping others.



Conserve
your energy.
Transform
your destiny.

– Viveka
se Jagriti.

THE INTEGRAL: ACCUMULATE ENERGY



DIFFERENTIATE $\frac{d}{dx}$ What to Differentiate



SENSE INDULGENCE

Differentiate between use and abuse of the senses.



IMPURE THOUGHTS

Observe and separate yourself from lustful thinking.



STIMULATING CONTENT

Differentiate what you consume—it shapes what you become.



LAZINESS & PROCRASTINATION

Act now. Don't let inertia drain your potential.



TOXIC COMPANY

Differentiate friends who elevate vs. those who degrade.



EGO & ATTENTION SEEKING

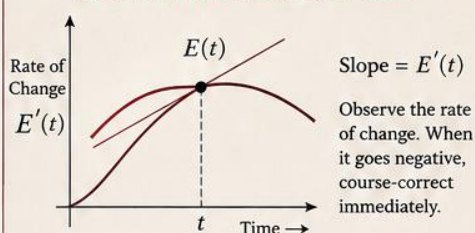
Let go of validation. Stay rooted in simplicity.



ESCAPE & DISTRACTIONS

Differentiate between rest and escape.

THE DERIVATIVE: DETECT CHANGE



THE BRAHMACHARYA EQUATION



RIGHT HABITS
& HIGH VALUES

(INTEGRATE CONSISTENTLY)



NEGATIVE INFLUENCES
& WEAKNESSES

(DIFFERENTIATE CONSTANTLY)



EXPONENTIAL GROWTH
IN ENERGY, CLARITY
& INNER FREEDOM

CALCULUS OF A BRAHMACHARI



PRESERVE

Guard your vital energy.
It is the root of creativity,
intelligence and spiritual power.



DIRECTION

Give your energy a higher
direction. Purpose multiplies
what discipline preserves.



TRANSFORMATION

Integrated values and
differentiated distractions
lead to a radiant life.

BE A CALCULATED SOUL. INTEGRATE THE DIVINE. DIFFERENTIATE THE DRAIN.
LIVE BRAHMACHARYA.

CALCULUS FOR SUCCESS

— BE AN EXCEPTIONAL EMPLOYEE —

Great employees know when to INTEGRATE and when to DIFFERENTIATE.
Use both to add the greatest value.

INTEGRATE

Bring together.
Connect.
Add value over time.



WHAT TO INTEGRATE



PEOPLE & PERSPECTIVES

Build strong relationships.
Listen and learn from others.



TEAMS & DEPARTMENTS

Collaborate across functions.
Break down silos.



FEEDBACK & IDEAS

Seek input. Combine insights.
Make better decisions together.



COMPANY GOALS & PURPOSE

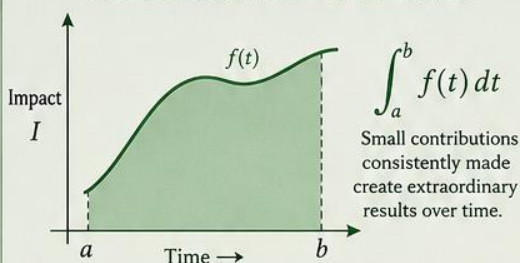
Align your work with the
big picture.



EXPERIENCES & LESSONS

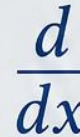
Learn continuously.
Integrate lessons into
future success.

THE INTEGRAL: ACCUMULATE IMPACT



DIFFERENTIATE

Stand out.
Solve problems.
Create change.



WHAT TO DIFFERENTIATE



THINK CRITICALLY

Question the status quo.
Find better ways.



FOCUS ON PRIORITIES

Identify what matters most.
Eliminate what doesn't.



TAKE INITIATIVE

Don't wait to be told.
Make things happen.



PROBLEMS

Solve root causes,
not just symptoms.

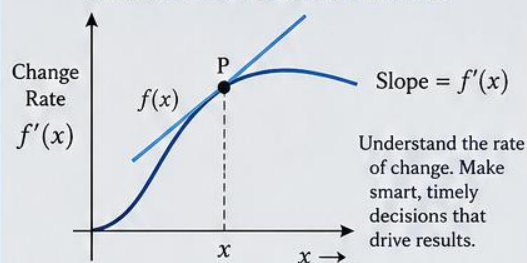


YOURSELF

Develop your skills.
Sharpen your strengths.
Keep growing.

INTEGRATE
TO BUILD
DIFFERENTIATE
TO LEAD
TOGETHER,
THEY CREATE
EXTRAORDINARY
IMPACT.

THE DERIVATIVE: CREATE CHANGE



THE ULTIMATE EQUATION

SUSTAINED IMPACT
 $\int$ Consistent effort,
relationships, and learning
over time

SMART IMPACT
+ $\frac{d}{dx}$ Bold thinking,
focus, and initiative
in the moment

=

**EXCEPTIONAL
EMPLOYEE**



BE A TEAM PLAYER.
INTEGRATE.



BE A DIFFERENCE MAKER.
DIFFERENTIATE.



BE IRREPLACEABLE.
CREATE LASTING VALUE.

INTEGRATE WISDOM. DIFFERENTIATE ACTION. LEAVE YOUR MARK.

CALCULUS OF LOVE

Be a Successful Husband. Be an Amazing Stepparent.

The best family isn't perfect. It's intentionally built.

INTEGRATE

BRING TOGETHER. MAKE WHOLE.

$$\int (\text{togetherness}) dx$$

The good of a blended family comes from consistent, intentional integration.



TIME

Integrate quality time daily. Small moments create a strong bond over time.



LOVE

Integrate unconditional love. Love them for who they are, not just as part of the package.



PATIENCE

Integrate grace into the process. Healing and trust take time to accumulate.



TRADITIONS

Integrate new traditions. Build shared memories that become your family culture.



TEAMWORK

Integrate as a united front. You and your spouse are the constant.

*Love is the function.
You are the variable.*



$$\text{STRONG FAMILY} = \int_{\text{CONSISTENT LOVE}}^{\text{EVERY DAY}} d(\text{choices})$$

Calibrate together. Communicate always. Commit daily.

DIFFERENTIATE

DISCERN. ADAPT. GUIDE.

$$\frac{d}{dx} (\text{approach})$$

Every child is unique. Adjust your approach with wisdom and awareness.



INDIVIDUALITY

Differentiate their needs, personality, and background. One size does not fit all.



FLEXIBILITY

Differentiate your parenting style. What works today may not work tomorrow.



LISTEN MORE

Differentiate by listening. Understand before you correct or direct.



EXPECTATIONS

Differentiate age-appropriately. Challenge them, but be realistic and encouraging.



SPACE TO GROW

Differentiate by allowing room to make mistakes and learn.

CHECK THE SECOND DERIVATIVE: THE HEALTH OF YOUR FAMILY

$$\frac{d^2}{dx^2} (\text{relationship}) = \begin{cases} \heartsuit & \text{Is there more love than stress?} \\ \checkmark & \text{Is trust increasing?} \\ \smiley & \text{Are we growing closer over time?} \end{cases}$$



If the answer is no, make small adjustments in your integration and differentiation. Then keep going.

INTEGRATE WITH PURPOSE. DIFFERENTIATE WITH WISDOM.

Lead with love. Stay the course. Legacy will follow.



LIVE HEALTHY TILL AGE 90

CALCULUS OF A LONG, HEALTHY LIFE

YOUR HEALTH IS A LONGION
OF YOUR DAILY CHOICES.

INTEGRATE MORE OF THIS

Build it up. Add consistently.
Small daily inputs create
a large, compounding impact.



NOURISHING FOOD

Whole, natural, nutrient-dense
foods. Eat to fuel, not just
to fill.



DAILY MOVEMENT

Move every day. Strength,
cardio, flexibility, balance.
Your body is designed
to move.



QUALITY SLEEP

7-9 hours of deep, restorative
sleep. Sleep is when your
body heals.



STRESS MANAGEMENT

Meditate, breathe, pray,
journal, or relax. Calm mind,
strong body.



MEANINGFUL RELATIONSHIPS

Connect deeply. Love and
belonging add years
to life.



LIFELONG LEARNING

Keep your mind curious.
Learn, explore, and stay
mentally active.



SUNLIGHT & NATURE

Get outside daily. Sunlight
boosts mood, sleep, and
vitamin D.



HYDRATION

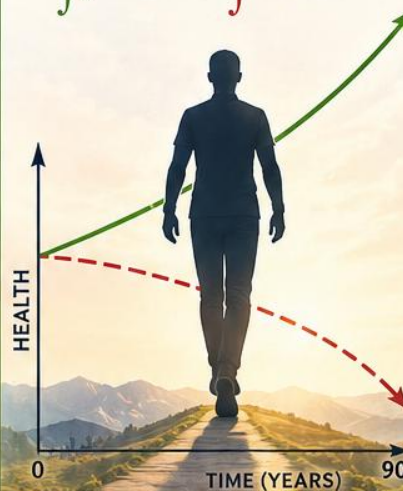
Drink enough water
throughout the day.
Every cell depends on it.

YOUR HEALTH OVER TIME
IS THE RESULT OF

$$\int \text{good habits } dt - \int \text{bad habits } dt$$

$$\text{HEALTH}(t) =$$

$$\int \text{good habits } dt - \int \text{bad habits } dt$$



You don't need to be perfect.

You just need to be

Consistent.

DIFFERENTIATE LESS OF THIS

Reduce it. Remove what
drains you. Small reductions
prevent big problems.



PROCESSED & JUNK FOOD

High in sugar, salt, unhealthy
fats, and additives. Fuels
disease.



SEDENTARY BEHAVIOR

Sitting for long hours
increases risk of disease
and shortens life.



TOBACCO & VAPING

Every puff damages your cells
and ages your body.



EXCESS ALCOHOL

More is not better.
It harms your liver, brain,
and sleep.



CHRONIC STRESS

Worry, anger, and negativity
accelerate aging and
disease.



EXCESS SCREEN TIME

Too much screen drains
focus, sleep, and mental
well-being.



TOXIC ENVIRONMENTS

Avoid pollution, toxins,
and negative people
as much as possible.



NEGATIVE SELF-TALK

Don't differentiate your
worth. Be kind to yourself.
You matter.



INTEGRATE DAILY
what makes you better.



DIFFERENTIATE DAILY
what makes you worse.

= 90

POSSIBLE.
POWERFUL.
WORTH IT.

CALCULATE TODAY. INVEST IN TOMORROW.

LIVE WELL. LIVE LONG. LIVE TO 90.

THE LIMIT
DOESN'T HAVE
TO BE YOUR

90



Small choices
every day



Compound
over time



Create decades
of healthy life



For you. For your
loved ones. For life.



Start now.
Your future self
is counting on you.

CALCULUS

THE SECRET RECIPE TO ELIMINATE ROACHES FROM YOUR KITCHEN!



Calculus helps us understand how roaches
GROW over time and how to **REDUCE** that growth!

INTEGRATE

(Accumulate Over Time)



REPRODUCTION
RATE



SIGHTINGS
OVER TIME



FOOD
LEFT OUT



MOISTURE
BUILD-UP

INTEGRATE to find the total number of roaches over a time period.

If $R(t)$ is the rate of increase of roaches (roaches per day) at time t , then the total number of roaches from time a to b is:

$$N(b) = N(a) + \int_a^b R(t) dt$$

What to integrate:

- Roach reproduction rate $R(t)$
- Roach sightings per day
- Food left out over time (attracts more roaches!)
- Moisture/leakage accumulation

Example:

If $R(t) = 20e^{0.1t}$ roaches/day, the total roaches from day 0 to day 30 is:

$$\int_0^{30} 20e^{0.1t} dt = 200(e^3 - 1) \approx 3,980 \text{ roaches}$$

Integrate to see the BIG PICTURE:
How many roaches are building up?

DIFFERENTIATE

(Rate of Change)

DIFFERENTIATE to find the rate of change and make the rate **NEGATIVE!**

If $N(t)$ is the total number of roaches at time t , then the rate of change is:

$$\frac{dN}{dt} = R(t) - C(t)$$

Where:

$R(t)$ = natural reproduction rate

$C(t)$ = control/elimination rate (your actions)

What to differentiate:

- Total roaches $N(t)$ to find daily change
- Effectiveness of pest control over time $C(t)$
- Population trends (increasing or decreasing?)
- How fast your actions are working!

Example:

If $N(t) = 400e^{0.08t} - 500(1 - e^{-0.3t})$,

then $\frac{dN}{dt} = 32e^{0.08t} - 150e^{-0.3t}$

Make $\frac{dN}{dt} < 0$ to reduce roaches over time!

Differentiate to take ACTION:
Make the rate of change negative!



PEST CONTROL
USAGE



BAIT & GEL
EFFECTIVENESS



CLEANING
RATE



WASTE
MANAGEMENT

THE GOAL: Make $\frac{dN}{dt} < 0$ and keep it negative!

- ✓ Increase $C(t)$: more cleaning, better bait, sealing cracks, remove food & water.
- ✓ Decrease $R(t)$: eliminate sources of food, water, and hiding places.
- ✓ Sustain your efforts so the total roach population goes to **ZERO!**

THE RESULT:

$$\lim_{t \rightarrow \infty} N(t) = 0$$

A ROACH-FREE KITCHEN!



**DON'T JUST HOPE.
USE CALCULUS!**



- ✓ OBSERVE
- ✓ ANALYZE
- ✓ INTEGRATE
- ✓ DIFFERENTIATE
- ✓ ELIMINATE!

**NO ROACHES.
NO WORRIES.
JUST CALCULUS. ♥**

CALCULUS YOUR CHANGE REDUCE 70 POUNDS

SMALL RATES TODAY. BIG CHANGE OVER TIME.



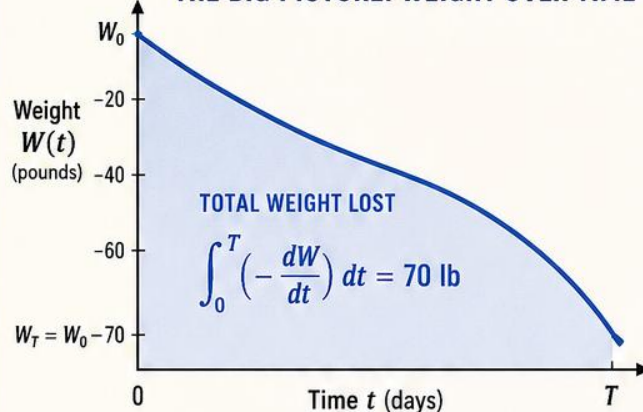
THE GOAL

Lose 70 pounds safely and sustainably through consistent daily habits.

$$W_0 - 70 = W_T$$

Start Weight (W_0)
- 70 lb
= Target Weight (W_T)

THE BIG PICTURE: WEIGHT OVER TIME



The area under your weight-loss rate curve equals the total pounds you lose.

THE TARGET

$$\int_0^T \left(-\frac{dW}{dt}\right) dt = 70$$

(pounds)

Stay consistent.
Let the integral do the work.

WHAT TO INTEGRATE (ACCUMULATE)

Integrate your daily weight-loss rate to get total pounds lost.



TOTAL POUNDS LOST

$$L(T) = \int_0^T \left(-\frac{dW}{dt}\right) dt$$

Set $L(T) = 70$ lb

PRACTICAL MEANING

Add up (integrate) your daily calorie deficit over time. That cumulative deficit is what creates lasting weight loss.



Daily Calorie Deficit
(cal/day)



$$\int_0^T$$

Deficit(t) dt
(total calories)



Total Weight Lost
÷ 3500
(approx. lb)

EXAMPLE TARGET PLAN

Average 500 calorie deficit per day.
 $\int_0^{140} 500 dt = 500(140) = 70,000$ calories
 $70,000 \div 3500 \approx 20$ lb
To lose 70 lb: $140 \times 3.5 \approx 490$ days
(Adjust deficit or time to fit your life.)

WHAT TO DIFFERENTIATE (ADJUST)

Differentiate to understand and improve your daily rate of change.



WEIGHT-LOSS RATE

$$\frac{dW}{dt}(t)$$

(pounds per day)

PRACTICAL MEANING

Differentiate (look at the rate) to see if you're improving, stalling, or slipping—then adjust.



IMPROVING

$$\frac{dW}{dt} \text{ more negative}$$

You're losing faster.
Keep it up!



STALLING

$$\frac{dW}{dt} \approx 0$$

Reassess calories, activity, sleep, stress.



SLIPPING

$$\frac{dW}{dt} \text{ positive}$$

Weight is increasing.
Make changes.

USE THE DERIVATIVE TO ADJUST

- Too slow? Increase activity or reduce intake.
- Too fast? Add calories to protect muscle & health.
- Track trends (7–14 day average) not just daily noise.
- Small changes in dW/dt create big differences in $\int$.



THE FORMULA FOR SUCCESS

Discipline (daily) → Consistency (over time)
→ Integration (70 lb lost)

70 POUNDS
IS NOT MAGIC.
IT'S WATH.

- ✓ Track your intake
- ✓ Move your body
- ✓ Prioritize sleep
- ✓ Be patient
- ✓ Trust the process

EVERY DAY
INTEGRATES.
YOUR FUTURE
TRANSFORMS.



ONE DAY IS A DIFFERENTIAL. A LIFETIME IS AN INTEGRAL.
START TODAY. YOUR FUTURE SELF IS WAITING.

CALCULUS: INTEGRATE & DIFFERENTIATE

Two Powerful Tools. Many Real-World Uses. Your Path to Success. 

CALCULUS helps us find ACCUMULATION (by integrating) and CHANGE (by differentiating).



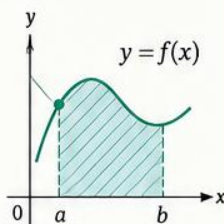
INTEGRATE

(Antiderivative)

Used to find total amount, accumulation, or area.

WHAT TO INTEGRATE

- Rate functions (to find total amount)
Example: velocity $\rightarrow$ displacement
- Area under a curve
Example: distance traveled, profit, cost, or area between curves
- Volume of solids
Example: using disks, washers, or shells
- Total change in a quantity
Example: total population growth, total revenue



KEY INTEGRAL RULES

$$\int k \, dx = kx + C$$

$$\int x^n \, dx = \frac{x^{n+1}}{n+1} + C \quad (n \neq -1)$$

$$\int \frac{1}{x} \, dx = \ln|x| + C$$

$$\int e^x \, dx = e^x + C$$

$$\int \sin x \, dx = -\cos x + C$$

$$\int \cos x \, dx = \sin x + C$$

EXAMPLES

1. Total distance traveled if velocity $v(t) = 3t^2 - 2$

$$s(t) = \int (3t^2 - 2) \, dt$$

$$= t^3 - 2t + C$$

2. Area under $y = x^2$ from $x = 0$ to $x = 2$

$$\text{Area} = \int_0^2 x^2 \, dx = \left[\frac{x^3}{3} \right]_0^2 = \frac{8}{3}$$



THINK: ACCUMULATION

Integrate to add up infinitely small pieces to get a total.



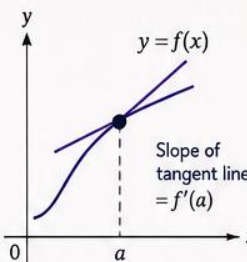
DIFFERENTIATE

(Derivative)

Used to find rate of change, slope, or instantaneous change.

WHAT TO DIFFERENTIATE

- Position functions (to find velocity)
Example: $s(t) \rightarrow v(t)$
- Velocity or rate functions (to find acceleration or related rates)
Example: $v(t) \rightarrow a(t)$
- Find slopes of tangent lines
Example: slope of $y = f(x)$ at a point
- Optimization problems
Example: maximize profit, minimize cost, find best dimensions



DERIVATIVE RULES

$$\frac{d}{dx}(k) = 0$$

$$\frac{d}{dx}(x^n) = nx^{n-1}$$

$$\frac{d}{dx}(e^x) = e^x$$

$$\frac{d}{dx}(\ln|x|) = \frac{1}{x}$$

$$\frac{d}{dx}(\sin x) = \cos x$$

$$\frac{d}{dx}(\cos x) = -\sin x$$

Constant Multiple: $\frac{d}{dx}[kf(x)] = k f'(x)$

Sum/Difference: $\frac{d}{dx}[f(x) \pm g(x)] = f'(x) \pm g'(x)$

Product Rule: $\frac{d}{dx}[f(x)g(x)] = f'(x)g(x) + f(x)g'(x)$

Quotient Rule: $\frac{d}{dx}\left[\frac{f(x)}{g(x)}\right] = \frac{f'(x)g(x) - f(x)g'(x)}{[g(x)]^2}$

EXAMPLES

1. If $s(t) = t^3 - 3t^2 + 2t$, find velocity $v(t)$.

$$v(t) = s'(t)$$

$$= 3t^2 - 6t + 2$$

2. Find slope of $y = x^2$ at $x = 3$.

$$y' = 2x$$

$$\text{Slope at } x = 3$$

$$= 2(3) = 6$$



THINK: CHANGE

Differentiate to find how a quantity changes at any instant.

THE BIG CONNECTION

Integration undoes differentiation.

$$\int f'(x) \, dx = f(x) + C$$



Differentiation undoes integration.

$$\frac{d}{dx}\left(\int f(x) \, dx\right) = f(x)$$

YOUR GOAL: 12-YEAR EDUCATION LEVEL & 1 YEAR CLERICAL EXPERIENCE



12-YEAR EDUCATION LEVEL

- ✓ Stay consistent
- ✓ Master the basics
- ✓ Practice every day
- ✓ Ask questions
- ✓ You've got this!



1 YEAR CLERICAL EXPERIENCE

- ✓ Attention to detail
- ✓ Organization
- ✓ Communication
- ✓ Time management
- ✓ Computer skills



These skills
+ your education
= Your bright
future!

Believe in
yourself!

ONE STEP AT A TIME.
YOU CAN DO IT!



Learn today. Apply tomorrow. Achieve your dreams.



CALCULUS = REAL SKILLS = REAL JOBS

♥ You can learn. You can work. You can build your future. ♥

CALCULUS HAS TWO POWERFUL TOOLS:

INTEGRATE

(Add things up)

INTEGRATE combines small pieces to find the total amount.

WHAT TO INTEGRATE:



1. AREA UNDER A CURVE

Find total distance, total cost, or total profit over time.



2. ACCUMULATION

Find total amount of water, money, inventory, or anything that builds up.



3. TOTAL CHANGE

Add up small changes to find the overall change.



4. TOTAL VALUE

Find total revenue, total cost, or total savings.

If $f(x)$ is a rate, then **TOTAL** amount

$$= \int_a^b f(x) dx$$

Think: Many small pieces → One big total

DIFFERENTIATE

(Find the change)

DIFFERENTIATE finds how something changes right now.

WHAT TO DIFFERENTIATE:



1. RATE OF CHANGE

Find speed, growth rate, or how fast something changes.



2. SLOPE / INSTANT CHANGE

Find the slope of a graph at any point.



3. OPTIMIZATION

Find maximum profit, minimum cost, or the best result.



4. PREDICTION & ANALYSIS

Understand trends and make smart decisions.

If y depends on x , then **RATE OF CHANGE**

$$= \frac{dy}{dx}$$

Think: See how something changes → Act smart

WHERE IS CALCULUS USED?



SALES & MARKETING

Forecast sales, maximize profit



BANKING & FINANCE

Interest, investments, risk analysis



MANUFACTURING

Production rates, cost optimization



LOGISTICS & SUPPLY CHAIN

Delivery time, fuel use, route optimization



HEALTHCARE

Drug levels, growth rates, diagnostics



TECH & DATA

Machine learning, AI, data modeling

♥ YOU CAN DO THIS!

- Start small.
- Practice every day.
- Ask questions.
- Never give up.

Your future is in your hands.



**LEARN TODAY.
PRACTICE TODAY.
GET HIRED. BUILD YOUR LIFE.**

*You are capable. You are valuable.
You belong in any workplace.*

★ TIPS TO SUCCEED

- ✓ Understand the idea
- ✓ Practice problems
- ✓ Use real-life examples
- ✓ Don't be afraid to try
- ✓ Consistency creates success



CALCULUS IS NOT JUST MATH. IT IS A SKILL FOR LIFE AND WORK.



YOUR FUTURE. YOUR CHOICE. YOUR NEW BEGINNING.

You can learn. You can grow. You can build the life you deserve.

You are
capable.

You are
WORTH IT.

You are
your future.

YOUR GOAL:

To become
**EMPLOYABLE,
CONFIDENT &
INDEPENDENT.**

One step at a time.
You will get there.

THE CALCULUS OF YOUR SUCCESS

INTEGRATE (Put Together)

Build Your Foundation



1. **LITERACY & BASIC SKILLS**
Learn to read, write and build confidence every day.

+



2. **JOB TRAINING & KNOWLEDGE**
Complete training programs and learn new skills.

+



3. **PERSONAL GROWTH**
Build confidence, stay positive, take care of your health and believe in yourself.

+



4. **SUPPORT & RESOURCES**
Use community resources, mentors, and support systems.



Together
these build
your path
to a better
future.

DIFFERENTIATE (Make You Stand Out)

Skills That Set You Apart in the Workplace



1. **CLERICAL SKILLS**
Typing, data entry, filing, using office equipment, basic computer skills.



2. **TIME MANAGEMENT**
Be on time, meet deadlines, plan your day and stay organized.



3. **WORKPLACE KNOWLEDGE**
Understand workplace rules, professional behavior, and how a job works.



4. **PROBLEM SOLVING**
Learn to solve simple problems, ask questions, and find solutions.

YOUR STEP-BY-STEP ROADMAP

1 START TODAY



- Set your goal
- Believe in yourself
- Be ready to learn

You can do this!

2 LEARN EVERY DAY



- Attend literacy lessons
- Practice reading and writing
- Keep learning

Small steps big change!

3 TRAIN YOUR SKILLS



- Take job training
- Practice new skills
- Ask for help when needed

Practice makes progress!

4 BUILD GOOD HABITS



- Manage your time
- Stay organized
- Be reliable

Good habits lead to success!

5 GET EXPERIENCE



- Look for entry-level jobs or internships
- Volunteer
- Learn on the job

Every experience counts!

6 GROW & MOVE FORWARD



- Keep improving
- Set new goals
- Build your future

Your best days are ahead!

EXAMPLES OF JOBS YOU CAN AIM FOR:



Office Assistant



Filing Clerk



Receptionist



Customer Service Rep



Data Entry Clerk



and more...

YOU ARE
**STRONGER
THAN YOU
THINK!**

REMEMBER:

- ✓ It's never too late to learn.
- ✓ Your effort today creates your tomorrow.
- ✓ Stay focused. Stay positive.
- ✓ You are building a better life!

I BELIEVE IN YOU!

LEARN. GROW. WORK. SUCCEED. *This is your journey. Own it!*

15 MORE YEARS. THEN RETIRE.

— Not dismissed. Not resigned. —
Just the plan.

INTEGRATE
the good. Accumulate.



- Daily impact
- Relationships
- Skills & knowledge
- Experience
- Small consistent efforts

$$I(t) = \int_{\text{now}}^{15} f_{\text{growth}}(t) dt$$

All the little things you do today
build a career—and a life—you're
proud to retire from.

DIFFERENTIATE $\frac{d}{dt}$
what no longer serves. Simplify.

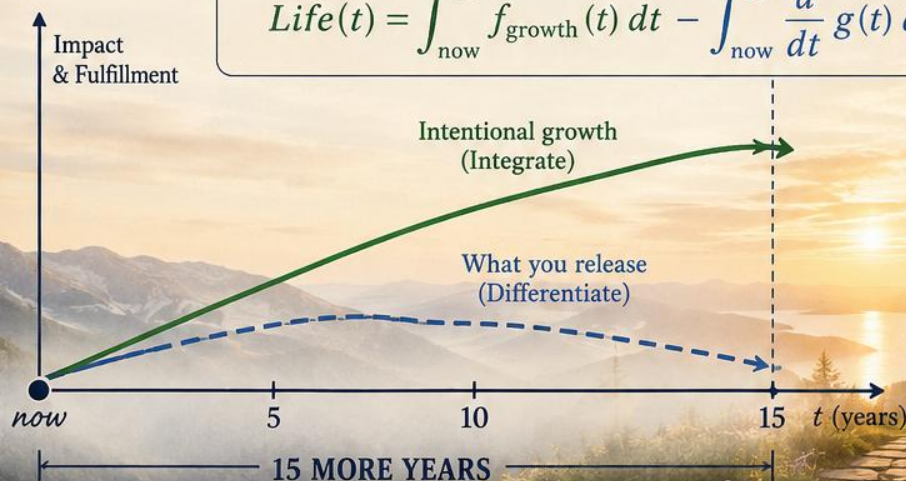
- Distractions
- Unnecessary stress
- Low-value tasks
- Comparison
- Energy drains

$$D(t) = \frac{d}{dt} g(t)$$

Differentiate to see what's changing
so you can focus your energy on
what truly matters.

The next 15 years is the **integral** of intentional actions
minus the **derivative** of what holds you back.

$$\text{Life}(t) = \int_{\text{now}}^{15} f_{\text{growth}}(t) dt - \int_{\text{now}}^{15} \frac{d}{dt} g(t) dt$$



THE PLAN:



FOCUS DAILY
Do what moves
the needle.



KEEP ACCUMULATING
Compounding >
shortcuts.



KEEP DIFFERENTIATING
Protect your time
and energy.



ARRIVE READY
Proud of the work.
Excited for what's next.

Do the math. Stay the course. Retire on purpose.

$$\int_a^b f(x) dx$$

$$\frac{d}{dx} x^n = nx^{n-1}$$



$$\frac{d}{dx} \sin x = \cos x$$

$$\int x^2 dx = \frac{x^3}{3} + C$$

I GRADUATED

— WITH A BACHELOR'S DEGREE —

Thanks, Calculus.

CALCULUS TAUGHT ME WHAT TO...

INTEGRATE

ACCUMULATE. COMBINE. MAKE WHOLE.

*Integrate the effort, the late nights,
the challenges, the lessons,
and every small win.*

WHAT TO INTEGRATE:

- ✓ Knowledge
- ✓ Hard Work
- ✓ Perseverance
- ✓ Mistakes (and what they taught me)
- ✓ Support from others
- ✓ Passion



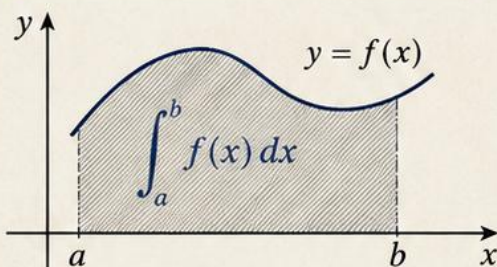
DIFFERENTIATE

ANALYZE. UNDERSTAND. GROW.

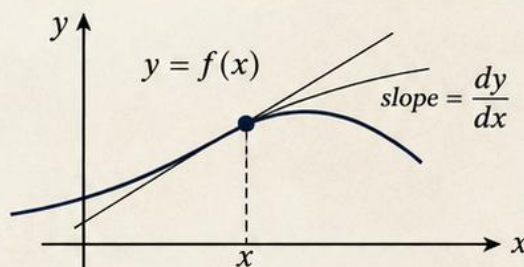
*Differentiate to understand how things
change, learn from the rate,
and keep improving.*

WHAT TO DIFFERENTIATE:

- ✓ My thinking
- ✓ My approach
- ✓ My habits
- ✓ My progress
- ✓ My future



Area under the curve:
Every bit adds up.



The derivative:
How fast I'm changing.

I INTEGRATED EVERYTHING IT TOOK.
I DIFFERENTIATED AND KEPT EVOLVING.
I EARNED THIS DEGREE.



Not dropped out. Not dismissed.

I SHOWED UP. I LEARNED. I FINISHED.

★ ★ — I GRADUATED. — ★ ★