

o pay \$10,000 of credit card debt 12 months, what needs to integrate and differentiate in daily life? Give a calculus-based poster.

Γ Create Note

CALCULUS OF DEBT ELIMINATION

How to Pay Off \$10,000 of Credit Card Debt in 12 Months

Goal Function

Let:

$$D(t) = \text{Credit Card Debt Remaining}$$

Starting condition:

$$D(0) = \$10,000$$

Target:

$$D(12) = \$0$$

Average monthly reduction needed:

$$\frac{10,000}{12} \approx \$833.33$$

Average weekly reduction:

$$\frac{10,000}{52} \approx \$192.31$$

Average daily reduction:

$$\frac{10,000}{365} \approx \$27.40$$

DIFFERENTIATE

Identify What Causes Debt to Grow

Debt increases when:

$$\frac{dD}{dt} > 0$$

Differentiate your daily life and locate the variables causing debt growth.

$$D(t) = Debt$$

Positive Debt Derivatives

Variable	Effect
Impulse purchases	Increases debt
Restaurant spending	Increases debt
Interest charges	Increases debt
Online shopping	Increases debt
Subscription creep	Increases debt
Late fees	Increases debt
Convenience spending	Increases debt

Ask daily:

"What activity caused dD/dt to become positive today?"

INTEGRATE

Accumulate Debt Reduction

Debt falls when:

$$\frac{dD}{dt} < 0$$

The integral of small daily actions produces large results.

Negative Debt Derivatives

Action	Effect
Extra principal payment	Reduces debt
Bringing lunch from home	Frees cash
Working overtime	Increases payment ability
Selling unused items	Produces lump-sum payment
Budget tracking	Prevents leakage
Automatic payments	Maintains momentum
Using cash/debit	Prevents new debt

DEBT PAYOFF INTEGRAL

$$\text{Debt Eliminated} = \int_0^{365} (\text{Daily Payments} + \text{Savings Captured}) dt$$

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Every saved dollar contributes to the area under the curve.

DAILY DEBT PAYOFF CHECKLIST

Differentiate:

- ☐ Did I spend money unnecessarily?
- ☐ Did I create new debt?
- ☐ Did I incur interest or fees?
- ☐ What spending category had the largest derivative today?

Integrate:

- ☐ Paid at least \$27.40 toward debt

- ☐ Avoided impulse purchases
 - ☐ Recorded all expenses
 - ☐ Increased income or reduced expenses
 - ☐ Sent extra money toward principal
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THE DEBT DECAY EQUATION

Think of debt like a melting block of ice:

$$\frac{dD}{dt} = \text{Interest} - \text{Payments}$$

To reach zero:

$$\text{Payments} > \text{Interest}$$

for many consecutive months.

$$\frac{dD}{dt} = \text{Interest} - \text{Payments}$$

CALCULUS PRINCIPLE OF FINANCIAL FREEDOM

Differentiate every expense.

Integrate every saved dollar.

Keep $dD/dt < 0$ every week.

If the negative slope is maintained for 12 months, the accumulated area of payments can reduce a \$10,000 credit-card balance to zero.

