

To reduce body weight by 70 pounds in 12 months, what needs to integrate and differentiate in daily life? Give a calculus-based poster.

CALCULUS OF LOSING 70 POUNDS IN 12 MONTHS

Goal

Lose 70 lb in 12 months

- $70 \text{ lb} \div 12 \text{ months} \approx 5.8 \text{ lb/month}$
- $70 \text{ lb} \div 52 \text{ weeks} \approx 1.35 \text{ lb/week}$

Think of weight loss as a calculus problem:

Differentiate the causes of weight gain.

Integrate the causes of health and fat loss.

DIFFERENTIATION

Identify the Rate of Change (dW/dt)

Ask daily:

What is increasing my weight?

$$\frac{dW}{dt}$$

Differentiate (Separate) These Variables

Variable	Question
Calories	Which foods add the most calories?
Sugary Drinks	Which drinks provide calories without fullness?
Snacking	When do unnecessary calories occur?

Variable	Question
Screen Time	When does sitting replace movement?
Sleep Loss	Which nights increase cravings?
Stress Eating	What events trigger overeating?
Restaurant Meals	Which meals are largest?
Weekend Habits	Where does progress disappear?

Daily Exercise:

Find one behavior producing the greatest positive rate of weight gain and reduce it.

INTEGRATION

Accumulate Healthy Actions

Weight loss is not one heroic action.

It is the sum of thousands of small actions.

$$\int \text{Healthy Actions } dt$$

Integrate These Daily

- ✓ Walking
- ✓ Strength training
- ✓ Fruits and vegetables
- ✓ Lean protein
- ✓ Water
- ✓ Sleep
- ✓ Stress management
- ✓ Meal planning

DAILY WEIGHT-LOSS EQUATION

A simple model:

$$Weight\ Loss = \int (Calories\ Burned - Calories\ Consumed) dt$$

When the area under the curve stays negative over time, body weight declines.

THE FOUR INTEGRALS

1. Movement Integral

Accumulate:

- Steps
- Walking
- Stairs
- Exercise minutes

Every day contributes area under the curve.

2. Nutrition Integral

Accumulate:

- Vegetables
- Protein
- Fiber
- Water

Reduce:

- Sugar
 - Fried foods
 - Excess portions
-

3. Sleep Integral

Accumulate:

- 7–9 hours nightly
- Consistent bedtime
- Dark sleeping environment

Good sleep lowers hunger and improves recovery.

4. Discipline Integral

Accumulate:

- Food logs
- Weight measurements
- Planning
- Self-control decisions

One good choice seems small.

Thousands create transformation.

MONTHLY DERIVATIVES

Track:

Metric	Desired Direction
Body Weight	↓
Waist Size	↓
Resting Heart Rate	↓
Daily Steps	↑
Sleep Hours	↑
Strength	↑
Energy	↑

These are the derivatives showing whether the system is improving.

THE FUNDAMENTAL THEOREM OF WEIGHT LOSS

Differentiation identifies:

"What is causing gain?"

Integration creates:

"What healthy actions accumulate over time?"

Together:

$$Future\ Body\ Weight = Current\ Weight + \int \frac{dW}{dt} dt$$

DAILY MANTRA

Differentiate the causes of excess weight.

Integrate healthy habits.

Repeat for 365 days.

Small daily changes become a 70-pound transformation.

< 2/2 >      ...

Is this conversation helpful so far?

