

# How Social Media Algorithms Deceive Us Mathematically

In our contemporary world, nothing happens by mere coincidence. Every passing thought, every sudden wave of melancholy, and even the throbbing headache that follows hours of scrolling on your phone has a scientific root. We live in an era where our emotions are governed by hyper-precise mathematical equations working in the shadows to direct our daily behavior. Social media has evolved from a simple entertainment tool into something like “Dopamine Trap” built upon complex probabilistic models.

## The Language of Numbers Behind the Vertical Screen

When you pick up your phone and open platforms like TikTok or Reels on Facebook, you aren't consuming random videos. You are the target variable in an Optimization Function. Tech companies utilize Machine Learning algorithms to compute a multi-dimensional matrix of your interests.

The mathematical objective is simple: Maximize time spent in trivial or worthless content, which will be variable named “ $T$ ”. Every design choice is calculated:

- **Mechanical Effort:** The vertical orientation minimizes the physical energy required from your thumb.
- **Switching Cost:** By reducing the friction between units in a sequence, the algorithm lowers the "cost" of moving to the next video.

Mathematically, as the effort required to transition between elements in a sequence approaches zero, the probability of infinite consumption increases, so we can say that vertical pose can decrease mechanical effort and therefore increase value of “ $T$ ”

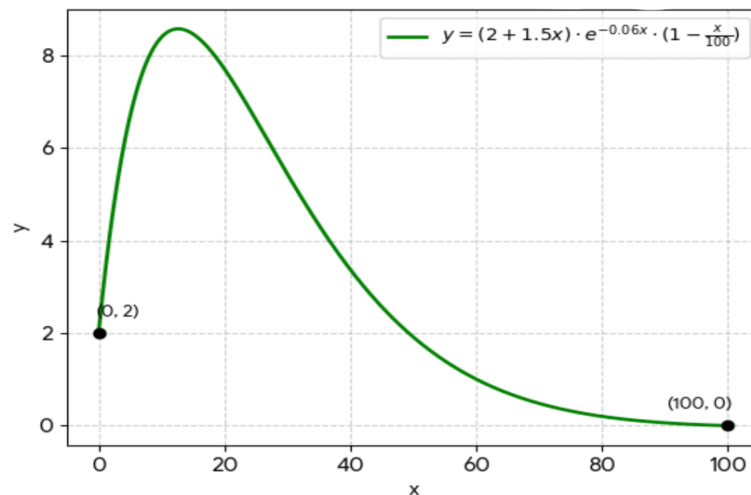
## Case Study: Student "S" and the Exponential Growth of Distraction

Consider Student “Mark” a diligent learner dedicated to research. When a friend sends him a comedic clip (on TikTok or any other platform), it triggers what neuroscience and mathematics call a “Dopamine Spike”. Initially, the relationship between pleasure and time is a simple linear correlation; Mark feels a sense of relief, and dopamine levels rise by a factor of “ $X$ ”.

However, as Mark enters the “rabbit hole” of fluctuating emotional content (by switching between tragedy and comedy to compensate) the equation changes. Pleasure no longer increases with time. He enters the zone of the Law of Diminishing Returns.

If the first video yields a pleasure value of (X), the 100 video yields a value approaching zero, yet it consumes mental energy and focus capacity at an exponential rate, resulting in distraction and a decrease in the quality of subsequent hours.

This distraction is not mere fatigue; it is “Noise” within the cognitive processing system. The human brain is optimized for Linear Processing (focusing on a single task), while social media forces it to process hundreds of shifting patterns in minutes, leading to "Latency" in response and a loss of passion for tasks requiring stable mental effort, such as deep study.



**Graph (1): shows dopamine level after first videos and its sudden drop after 100 videos**

**X-axis is videos number**

**Y-axis is dopamine level  
(hypothetical by numbers)**

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The danger lies not in the hour itself, but in the additional value of time (Marginal Value) of the time that follows. The hour spent on TikTok or Reels does not end when the app closes. It leaves a residual effect called “Decaying Function” that drains focus for hours afterward. Headaches and exhaustion are mathematical indicators that the System (your brain) has exceeded its maximum processing capacity.

This is where the ethical and spiritual dimension becomes the foundation of everything. When these algorithms affect our attention, they don't just steal time, but they steal our prayers, our physical health, and our real life. Real activities and religious doctrine with the god act as breather for the soul and mind. It is the only function that yields consistent positive results without negative side effects.

### **Smart Alternatives: what we can do to manage our life**

Rather than being “Variables” in the equations of tech giants, we can be the "Programmers" of our own lives:

- **Purposeful Entertainment:** when we use social media, we should use it for structured data, such as educational animations that explain mechanics or societal issues.
- **Physical Activity:** Exercise raises dopamine naturally and sustainably, improving both psychological and physical health.
- **Real-World Socialization:** Engaging with friends in the fresh air provides a natural Dopamine Boost, and positive energy far removed from the world of screens and probabilities.