

The Snappiness of Snapchat: Expressing How Fast It Changes!



"It would take you 10 years to view all the photos shared in the last hour on Snapchat," a business website claims. "By the time you'd viewed those, another 880,000 years' worth of photos would have been shared." How fast are people loading photos to Snapchat?

1. The number of photos on Snapchat is always changing.
 - a. What might cause the **number of Snapchat users** to grow or decline?

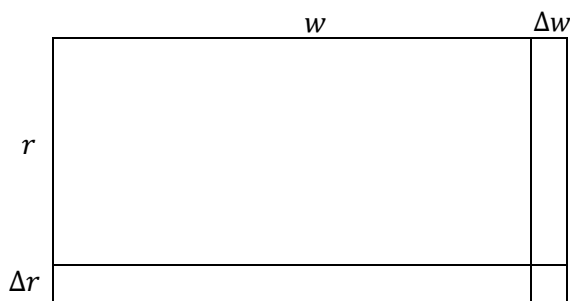
 - b. What might cause an individual to post more or fewer **photos**?

2. Let's assume that the number of photos shared by an individual Snapchat user is w and the number of Snapchat users is given by r .
 - a. What does $w \cdot r$ represent in this context?

 - b. What does Δw represent in this context?

 - c. What does Δr represent in this context?

3. The diagram below gives a visual of how these variables affect each other.
 - a. Use hashtags (like this:) to shade the region that represents the **current total number of photos** shared on Snapchat.
 - b. Use hashtags (like this:) to shade all the regions that represent the **change** in the **total amount of photos** shared on Snapchat.



- c. Write an equation for the overall change in the number of photos shared.

Overall change in photos shared = _____

4. Suppose we wanted to know how *fast* people are sharing (the change in photos *per* day, hour, minute, etc.).
 - a. What would we have to do to each of the quantities in part 3c?

 - b. What if we wanted to see how fast people are sharing *right now*?

The Product Rule

Important Ideas:

Check Your Understanding

1. Given that $f(x) = 2x^2(x^3 - 3)$, find $f'(x)$ in two different ways.

2. Find $\frac{dg}{dt}$ using the product rule if $g(t) = \frac{e^t}{t^2}$

3. Find $f'(x)$ if $f(x) = 4x^3 \ln x$

4. If $f(x) = xe^x$, report each. Hint: Look back. Look forward.

a. $f'(x) =$

b. $f''(x) =$

c. $f'''(x) =$

d. $f^{(100)}(x) =$

e. $f^{(n)}(x) =$