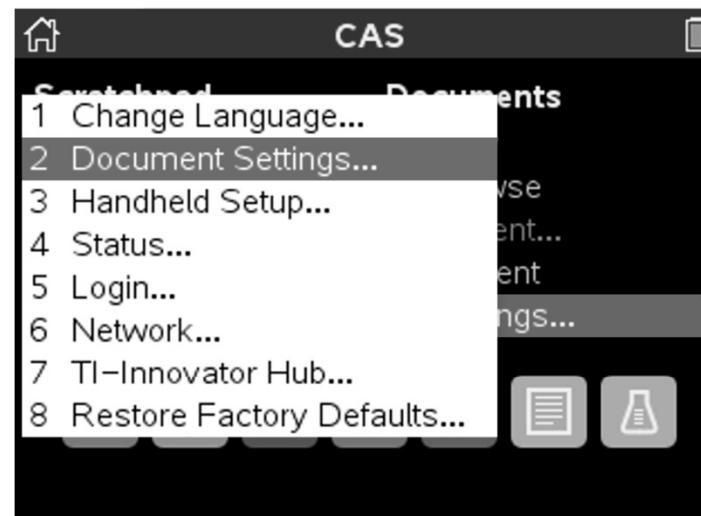
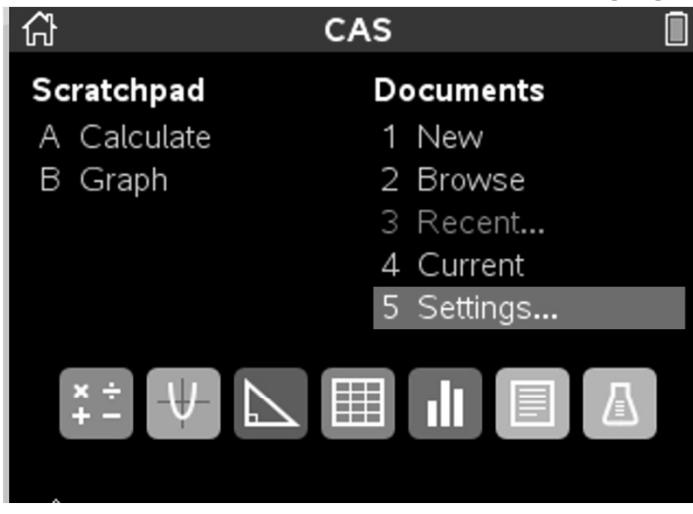


Calculations with Waveforms

- *DC*
- *Sine*
- *Ramp*
- *Exponentials (2)*
- *plot*
- *derivative*
- *integral*
- *simplify*

TI Nspire setup



Document Settings

3

- Display Digits: ▶
- Angle: ▶
- Exponential Format: ▶
- Real or Complex: ▶
- Calculation Mode: ▶
- CAS Mode: ▶

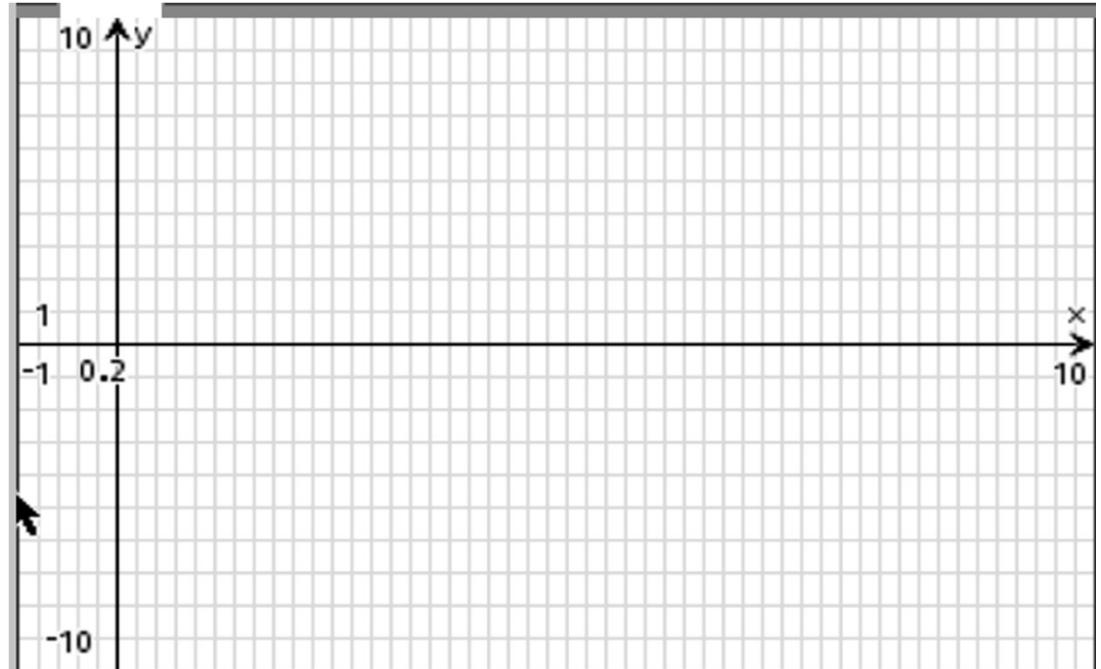


OK

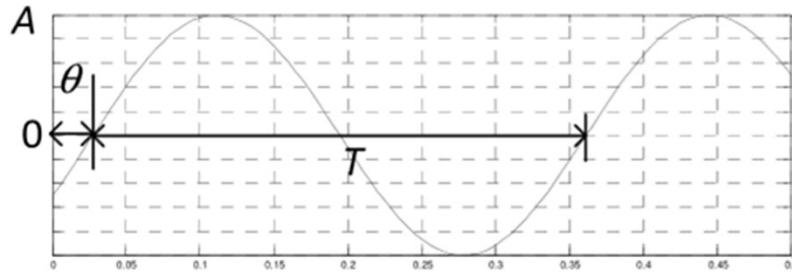
Cancel

DC

- A
 - $A = \text{your age}/4$
 - Sketch: $x \geq 0 \Rightarrow 7 \text{ s}$
-
- $\frac{d}{dt}A = ?$
 - $\int A \, dt = ?$

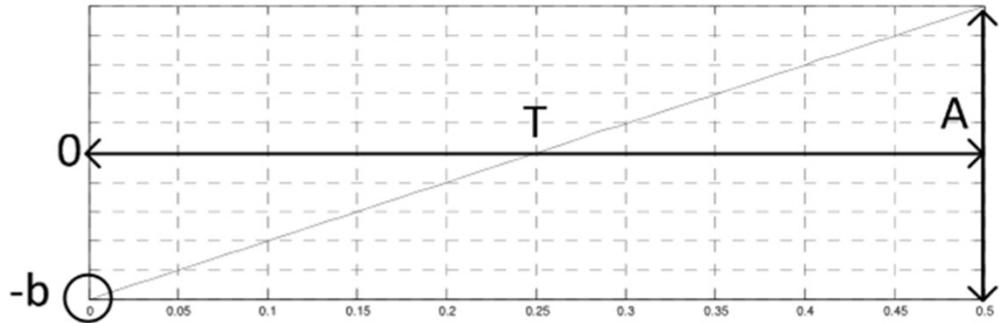


Sine



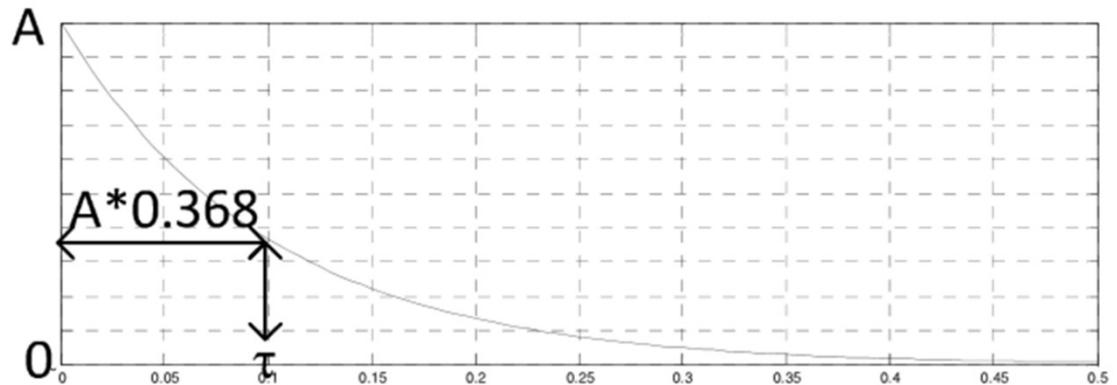
- $A\sin(2\pi ft - \theta)$ $f = \frac{1}{T}$
 - $A = \underline{\hspace{2cm}}$
 - $T = \underline{\hspace{2cm}} \mu\text{sec}$ $f = \underline{\hspace{2cm}}$ $\Theta = \underline{\hspace{2cm}} \text{ deg}$
 $= \underline{\hspace{2cm}} \text{ rad}$
 - Write the equation
 - $\frac{d}{dt} A\sin(2\pi ft - \theta) = ?$
 - $\int A\sin(2\pi ft - \theta) dt = ?$

Ramp



- $A = \underline{\hspace{2cm}}$ $b = \underline{\hspace{2cm}}$
- Write the equation
- $mt + b = \frac{A}{T}t + b$
- $\frac{d}{dt} \left(\frac{A}{T}t + b \right) = \underline{\hspace{2cm}}$
- $\int \left(\frac{A}{T}t + b \right) dt = \underline{\hspace{2cm}}$

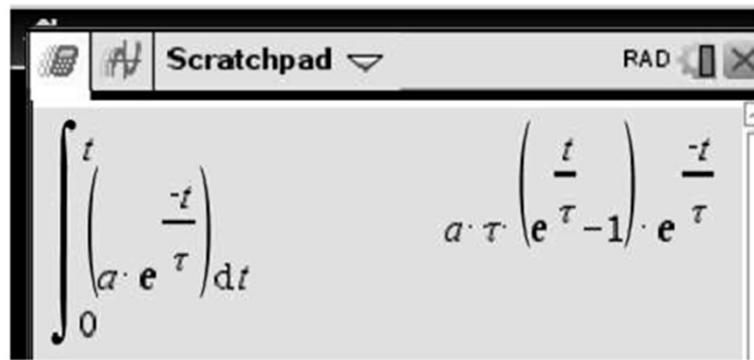
Exponential Spike



- $Ae^{\frac{-t}{\tau}}$
- $A = \underline{\hspace{2cm}}$ $\tau = \underline{\hspace{2cm}} \text{ msec}$
- Write the equation
- Plot is for $0 \Rightarrow 0.5 \text{ ms}$
- $\frac{d}{dt} Ae^{\frac{-t}{\tau}} = ?$
- $\int Ae^{\frac{-t}{\tau}} dt = ?$

Exponential Spike

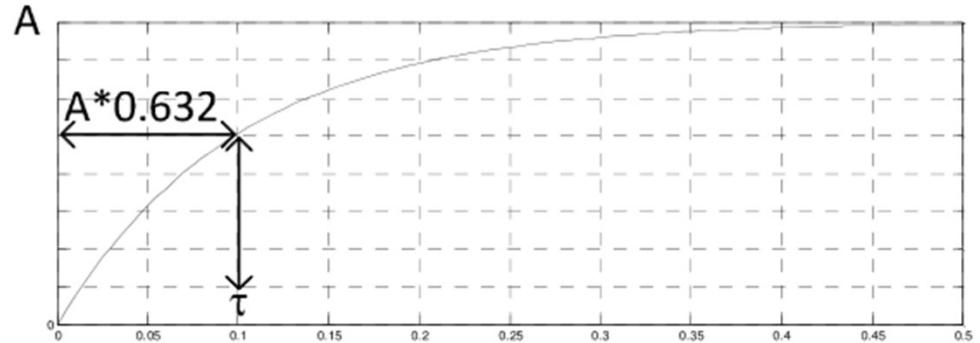
Simplify



A screenshot of a software interface titled "Scratchpad". The window shows a mathematical expression: $\int_0^t \left(A \cdot e^{-\frac{t}{\tau}} \right) dt$ on the left, and its simplified form $A \cdot \tau \left(e^{-\frac{t}{\tau}} - 1 \right) \cdot e^{-\frac{t}{\tau}}$ on the right. The background is light gray, and the text is black.

$$\int_0^t \left(A e^{-\frac{t}{\tau}} \right) dt = A \tau \left(1 - e^{-\frac{t}{\tau}} \right)$$

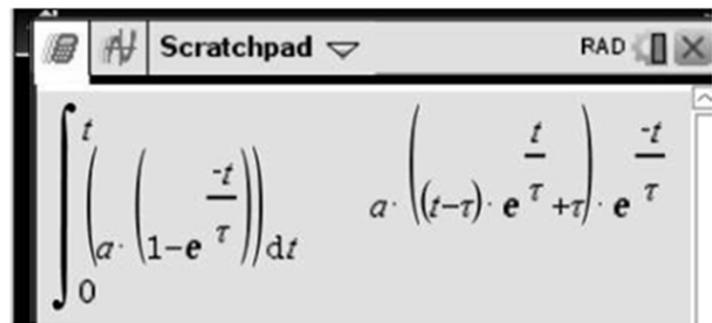
Exponential Rise



- $A(1 - e^{\frac{-t}{\tau}})$
- $A = \text{_____}$ $\tau = \text{_____}$ msec
- Write the equation
- Plot is for $t \in 0 \Rightarrow 0.5$ ms
- $\frac{d}{dt} A(1 - e^{\frac{-t}{\tau}}) = ?$
- $\int A(1 - e^{\frac{-t}{\tau}}) dt = ?$

Exponential Rise

Simplify



A screenshot of a software interface titled "Scratchpad". The window shows a mathematical expression involving an integral from 0 to t . The integrand is $A \cdot \left(1 - e^{\frac{-t}{\tau}}\right)$. The result of the integration is displayed as $A \cdot \left(t - \tau \left(1 - e^{\frac{-t}{\tau}}\right)\right)$.

$$\int_0^t \left(A \cdot \left(1 - e^{\frac{-t}{\tau}}\right) \right) dt = A \cdot \left(t - \tau \left(1 - e^{\frac{-t}{\tau}}\right) \right)$$

$$\int_0^t \left[A \left(1 - e^{\frac{-t}{\tau}}\right) \right] dt = A \left[t - \tau \left(1 - e^{\frac{-t}{\tau}}\right) \right]$$