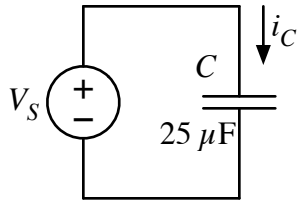
EE 201 — HW 5.4 Name_____

A time-varying voltage source is connected to a 25-μF capacitor. The source has the following time-dependence:

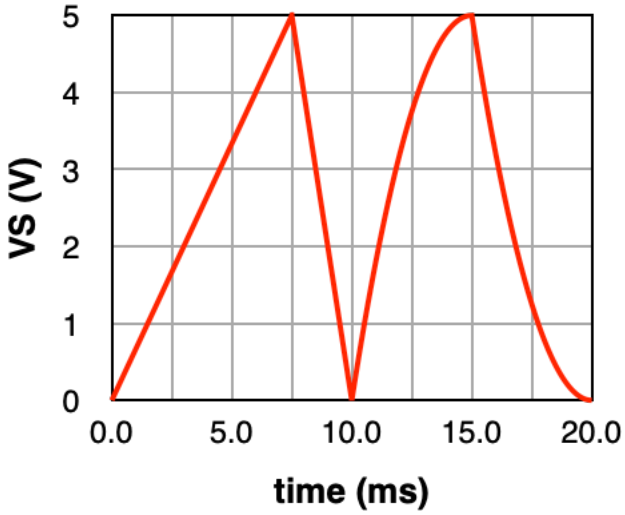


For $0 < t \le 7.5$ ms, the voltage increases linearly:

$$V_S(t) = \left(667\ \text{V/s}\right) \cdot t$$

For $7.5\ \text{ms} < t \le 10$ ms, the voltage decreases linearly:

$$V_S(t) = 5\ \text{V} - (2000\ \text{V/s})\left(t - 7.5\ \text{ms}\right)$$



For $10\ \text{ms} < t \le 15$ ms, the voltage increases parabolically:

$$V_S(t) = 5\ \text{A} - \left(2 \times 10^5\ \text{V/s}^2\right)\left(t - 15\ \text{ms}\right)^2$$

For $15\ \text{ms} < t \le 20$ ms, the current decreases parabolically:

$$V_S(t) = \left(2 \times 10^5\ \text{A/s}^2\right)(t - 20\ \text{ms})^2$$

Write your answers — and whatever work will fit — on this sheet. Staple any sheets with additional work behind.