

1.1

EE 220D - 1 6/9/14

a) 7.573×10^{37} electrons

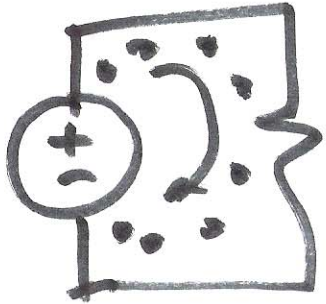
$$Q_{TOT} = 7.573 \times 10^{37} \text{ electrons} \cdot \frac{1.6 \times 10^{-19} \text{ C}}{\text{electron}}$$

~~Q_{TOT}~~

b) $I = \frac{7.573 \times 10^{37} \cdot 1.6 \times 10^{-19}}{1 \text{ ms}}$

c) $10 \text{ A} = \frac{\# \text{ of electrons} \cdot \text{electron } q}{60 \text{ seconds}}$

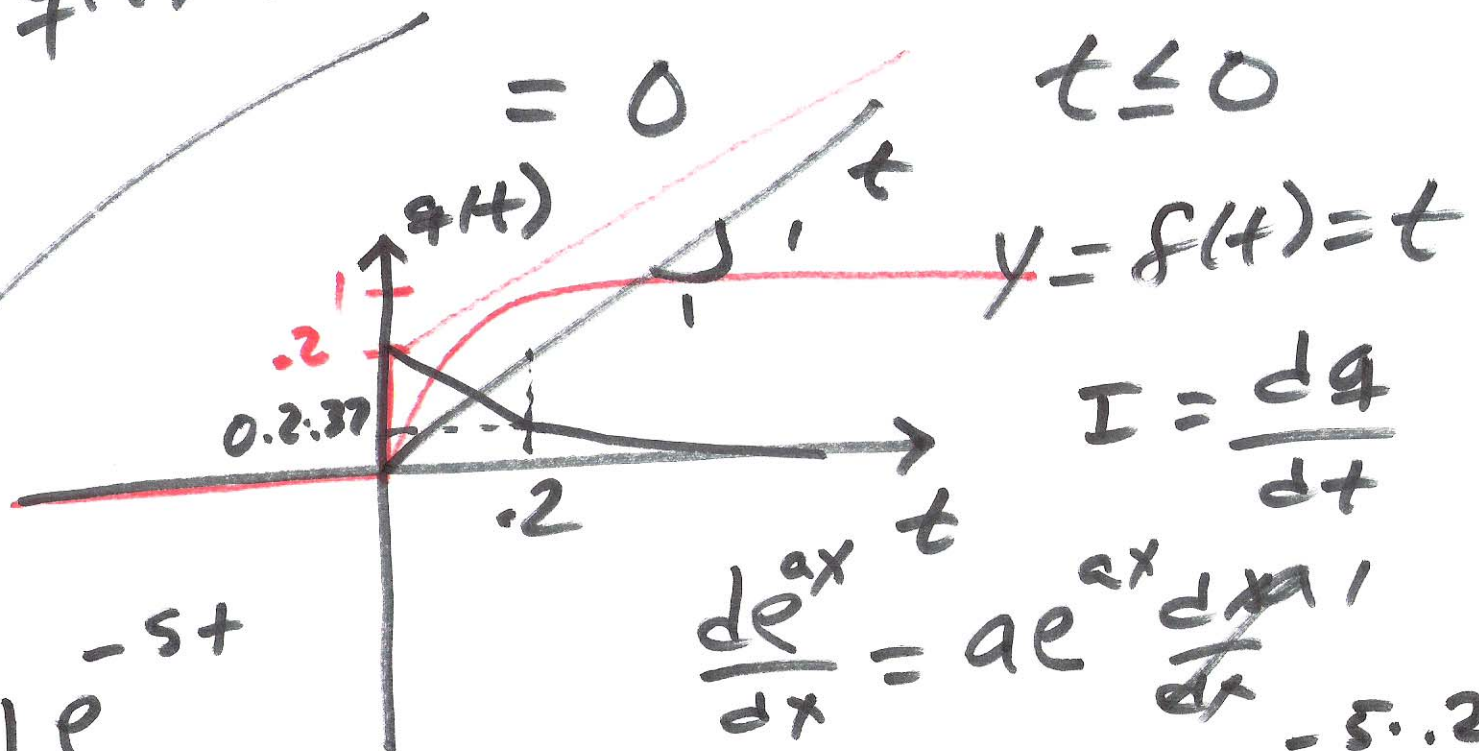
1)



d)

$$q(t) = t + 0.2e^{-5t} \quad t \geq 0$$

$$= 0 \quad t \leq 0$$



$$y = f(t) = t$$

$$I = \frac{dq}{dt}$$

$$\frac{d e^{ax}}{dx} = a e^{ax} \frac{dx}{dx} = a e^{ax}$$

$$\frac{dq}{dt} = 1 - 1e^{-5t}$$

$$I = 1 - e^{-5t}$$

$$0.2 = t$$

$$0.37 \cdot 0.2 = \frac{0.2}{e}$$

$$0.2e$$

$$\frac{1}{e} \approx \frac{1}{2.7} \approx 0.37$$

2)