

Quiz #1 Solution

1. (30 points) Since thermistor has the following characteristics:

$$R(t) = -t + 160 [K\Omega]$$

resistance for $t=80^\circ\text{F}$ will be:

$$R_{\min} = -80 + 160 = 80 K\Omega,$$

and resistance for $t=40^\circ\text{F}$ will be:

$$R_{\max} = -40 + 160 = 120 K\Omega$$

$$V_{\min} = \frac{R_{\min}(t)}{R + R_{\min}(t)} 2V = \frac{80}{80 + 80} 2V = 1V$$

$$V_{\max} = \frac{R_{\max}(t)}{R + R_{\max}(t)} 2V = \frac{120}{80 + 120} 2V = 1.2V$$

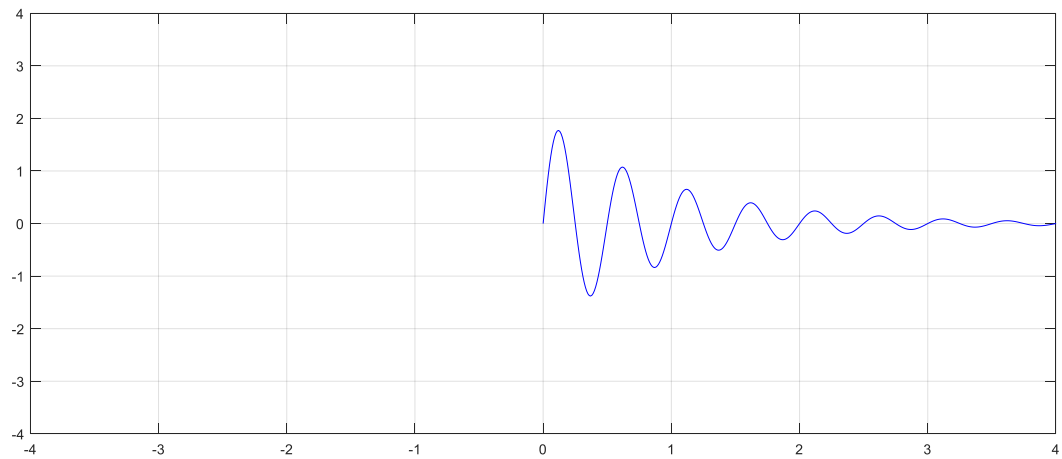
2. (10 points) $\int_2^4 x \, dx = \left. \frac{x^2}{2} \right|_2^4 = \frac{16}{2} - \frac{4}{2} = 6$

3. (10 points) $\int_0^1 \sin(2\pi t) \, dt = -\frac{1}{2\pi} \cos(2\pi t) \Big|_0^1 = 0$

4. (20 points) Infinite sum: $1 + \frac{1}{4} + \frac{1}{16} + \dots = \sum_{i=0}^{\infty} \left(\frac{1}{4}\right)^i = \frac{1-r^{\infty}}{1-r} = \frac{1}{1-\frac{1}{4}} = \frac{4}{3}$

5. (20 points)

$$y = 2 \cdot e^{-t} \sin(4\pi t), t \geq 0.$$



6. Plot *sinc* function $\left(\frac{\sin x}{x}\right)$.

