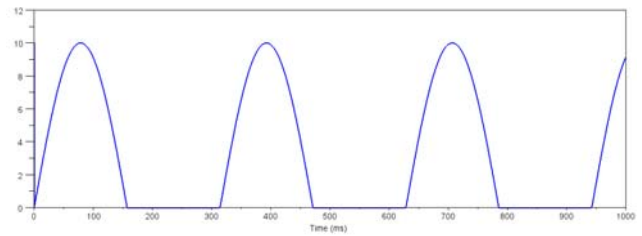


EE 206: Homework #11

Fourier Transform and Superposition with Phasors
Due Monday, April 15th

Let V_{in} be a half-rectified sine wave

$$V_{in} = \begin{cases} 10 \sin(20t) & \sin(20t) > 0 \\ 0 & \text{otherwise} \end{cases}$$



1) Find $y(t)$ by approximating V_{in} as

$$V_{in} = a + b \sin(20t)$$

where

- $a = \text{average}(V_{in})$
- $b = 1/2$ of the peak-to-peak voltage of V_{in}

2) Determine the first 3 terms of the Fourier series approximation for V_{in}

$$V_{in} \approx a_0 + a_1 \cos(20t) + b_1 \sin(20t) + a_2 \cos(40t) + b_2 \sin(40t)$$

3) For your result of problem #2, determine $y(t)$

