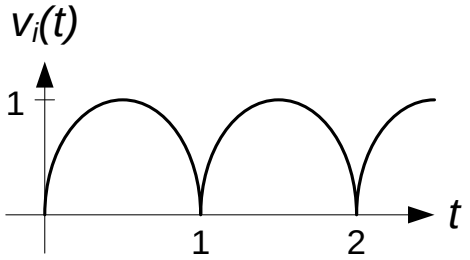
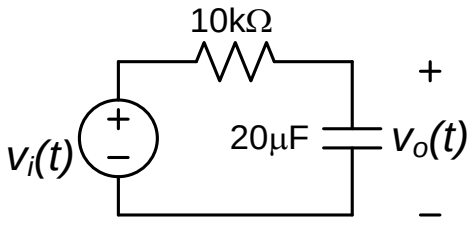
All problems use the following waveform and schematic. Note the waveform is a full-bridge rectified sin.





P1 **Concept:** Fourier Series cos/sin analysis
Find: DC and first two harmonics of input waveform in a,b form. Make coeffs numeric, not symbolic (e.g. 1.27 not $4/\pi$).
Hints:
- While the waveform's $\omega_0 = 2\pi$, it is not $\sin(2\pi t)$ from $0 \le t < 1$. It is either twice or half that frequency to get just the upper half of sin in $0 \le t < 1$.
- a0 has 3 and a 6 in it (not necessarily in that order)
- a1 has a 4 and a 2 in it (not necessarily in that order)

P2 **Concept:** Fourier Series magnitude/phase analysis
Find: $A_0,\ A_1\angle\phi_1,\ A_2\angle\phi_2$ of the input waveform

P3 **Concept:** Frequency transfer functions
Find: H(ω)
Hints:
- There is a 5 in the numerator and a simple single-pole denomenator

P4 **Concept:** Fourier Series circuit analysis
Find: $A_0',\ A_1'\angle\phi', A_2'\angle\phi'$ of the output waveform
Hints:
- A_0' has a 3,6 in it, not necessarily in that order
- A_1' has a 2,6 in it, not necessarily in that order

P5 **Concept:** Fourier Series synthesis
Find: Output waveform as constructed by its DC and first two harmonics

P6 Not for grade, just a thought question: if you were doing this for industry, how would you know how many harmonics you need to add to get an answer that was, say, accurate to about 1%?