

-
1. Band-pass filter. Two different configurations are possible. Both are acceptable, but you only need one or the other.
 2. Subtract DC offset. Remaining function is odd. Which coeff's are zero?
 3. b_1 is close to -1
 4. Plug in $k=3$; $\cos(3\omega_0 t)$ term disappears. $v_{o3}(t)$ is about 5 mV magnitude