1. A full-scale sine wave with frequency $f_X = 7$ MHz is input to a DAC clocked at $f_S = 20$ MHz. Calculate the frequency and amplitude (relative to full-scale input) of all tones in the DAC output up to $f = 50$ MHz. Assume the DAC output for each sample is held for 30 ns and returned to zero for 20 ns. Ignore quantization noise and other non-idealities.

2. For the differential switched-capacitor integrator below, find the z-domain output/input transfer function assuming:
   a) Output is sampled in $\Phi_1$
   b) Output is sampled in $\Phi_2$
   c) For output sampled in $\Phi_2$, find the continuous-time equivalent for the integrator time-constant using the output expression derived. Assume $f_{signal} / f_{sampling} << 1$. 

![Differential Switched-Capacitor Integrator Diagram]