1. A full-scale sine wave with frequency $f_x=7\,\text{MHz}$ is input to a DAC clocked at $f_s=20\,\text{MHz}$. Calculate the frequency and amplitude (relative to full-scale input) of all tones in the DAC output up to $f=50\,\text{MHz}$. Assume the DAC output for each sample is held for 30\,\text{ns} and returned to zero for 20\,\text{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 $f_{signal}/f_{sampling} << 1$. 

\begin{center}
\includegraphics[width=0.8\textwidth]{circuit.png}
\end{center}