Spectrum of a Periodic Signal Given by Fourier Series

For the simple periodic pulse signal \( p(t) \)

\[
C_k = \sin \frac{\pi k T_a}{T} \left\{ \begin{array}{ll}
1 & k = \pm 1, \pm 3, \pm 5, \ldots \\
0 & \text{otherwise}
\end{array} \right.
\]

Given pulse signal \( p(t) = p_a \left( t - \frac{A}{2} \right) + p_a \left( t - \frac{3A}{2} - \frac{A}{2} \right) \)

\( \Rightarrow \) its Fourier series is

\[
C_k = e^{j \frac{\pi k A}{T_A}} \left[ 1 + (-1)^k \right] \sin \frac{\pi k A}{T_A} \left\{ \begin{array}{ll}
1 & k = \pm 1, \pm 3, \pm 5, \ldots \\
0 & \text{otherwise}
\end{array} \right.
\]
b) To be used for sampling, must have $\frac{1}{3} > 2W$. However, the number of samples is twice as high as the "usual". An 'aggie' answer!