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1) Consider a passband signal with bilateral bandwidth Δf, centered at frequency f_0. A possible sampling frequency interval to sample the signal without aliasing is $\frac{26}{4} \leq f_s \leq \frac{22}{3}$. In this case:

☐ $f_0 = 10,\ \Delta f = 3$.

☐ $f_0 = 12,\ \Delta f = 1$.

☒ there are 6 possible sampling frequency intervals.

☐ $f_0 = 12,\ \Delta f = 3$.

2) A passband signal with bilateral bandwidth Δf, centered at frequency f_0, can be sampled with $5 \leq f_s \leq 6$. In this case:

☐ $\Delta f = 1$ and $f_0 = 3$.

☐ $\Delta f = 2$ and $f_0 = 3$.

☒ $\Delta f = 2$ and $f_0 = 4$.

☐ $\Delta f = 5$ and $f_0 = 6$.

1) the fraction $\frac{22}{3}$ cannot be reduced more so $N-1=3$, $N=4$ for this sampling interval. therefore

$$\begin{cases} 2\left(f_0+\frac{\Delta f}{2}\right)=26 \\ 2\left(f_0-\frac{\Delta f}{2}\right)=22 \end{cases} \rightarrow \begin{cases} f_0=12 \\ \Delta f=2 \end{cases} \qquad N_{max}=\left\lfloor \frac{f_M}{\Delta f} \right\rfloor = \left\lfloor \frac{f_0+\frac{\Delta f}{2}}{\Delta f} \right\rfloor = 6$$

2) $5<f_s<6$ $\qquad \frac{2}{N}\left(f_0+\frac{\Delta f}{2}\right)<f_s<\frac{2}{N-1}\left(f_0-\frac{\Delta f}{2}\right)$

Need to try different values of $N \geq 2$ ($N=1$ is not a solution because the interval is finite)

$$N=2 \rightarrow \begin{cases} f_0+\frac{\Delta f}{2}=5 \\ 2\left(f_0-\frac{\Delta f}{2}\right)=6 \end{cases} \rightarrow \begin{cases} 2f_0=5+3=8 \\ \Delta f=5-3=2 \end{cases} \rightarrow \begin{cases} f_0=4 \\ \Delta f=2 \end{cases}$$