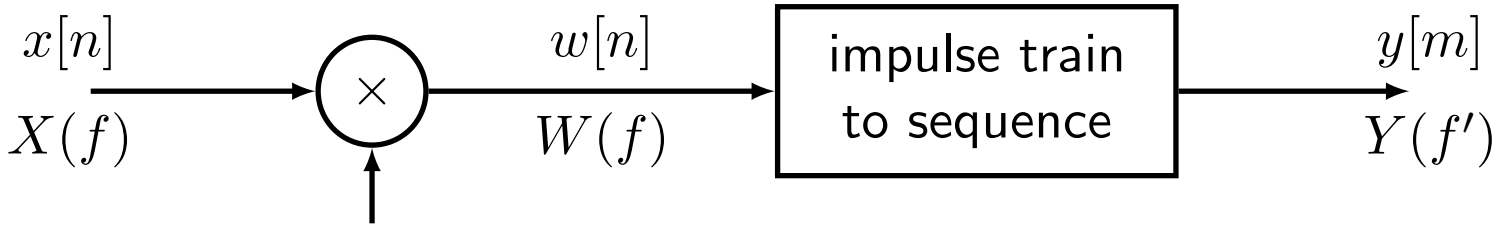
summary

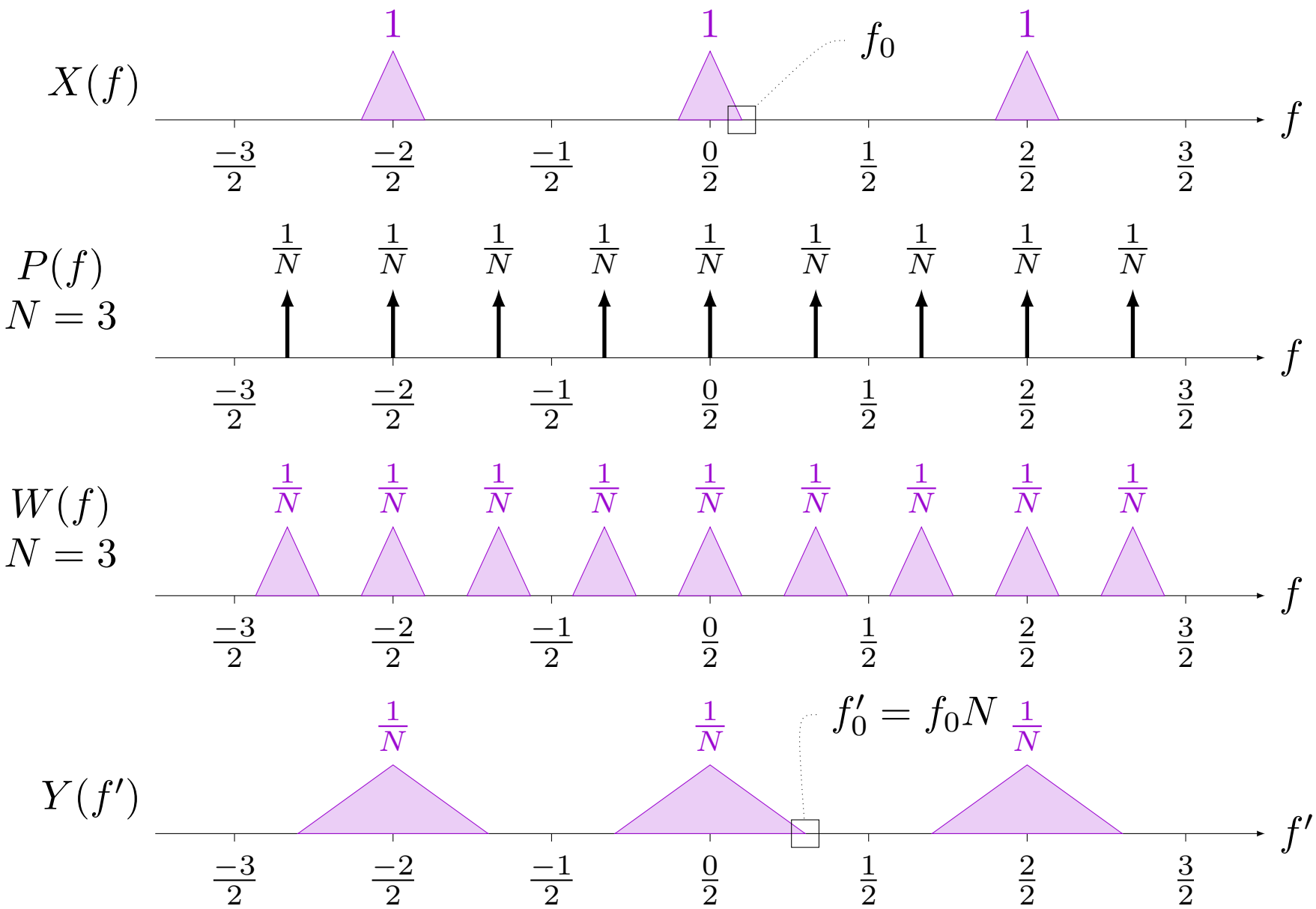


$$p[n] = \sum_{m=-\infty}^{\infty} \delta[n - mN] \quad \leftrightarrow \quad P(f) = \frac{1}{N} \sum_{m=0}^{N-1} \sum_{k=-\infty}^{\infty} \delta\left(f - \frac{m}{N} - k\right)$$

aliasing formula: $$W(f) = \frac{1}{N} \sum_{k=0}^{N-1} X\left(f - \frac{k}{N}\right)$$

down sampling formula: $$Y(f') = \frac{1}{N} \sum_{k=0}^{N-1} X\left(\frac{f' - k}{N}\right)$$

graphical approach



graphical approach