where the signs are reversed from the usual convention because this is in the frequency domain. But from the bandlimited assumption,

$$a_k = \int_{-\infty}^{\infty} X(f)e^{j2\pi kf} df = x(k) = y[k]$$

so that

$$X(f) = \sum_{k=-\infty}^{\infty} y[k]e^{-j2\pi kf} = Y(f)$$

- As earlier,

$$Y(f) = \frac{X(f)}{1 - e^{-j2\pi f}}$$