Problem 1. Assume f has poles $b_1, \ldots, b_k$ with residues $r_1, \ldots r_k$, and $|zf(z)| \to 0$ as $z \to \infty$. Show that

$$\sum_{-\infty}^{\infty} f(n) = -\sum_{1}^{k} (\pi \cot \pi b_j) r_j.$$

Problem 2. Let $a \neq 0$. Find the explicit values of

$$(a) \ \sum_{0}^{\infty} \frac{1}{n^2 + a^2},$$

$$(b) \ \sum_{0}^{\infty} \frac{1}{n^4 + a^4}$$