Recommended Problems

Problem 1 (DF, Problem 7, p. 455)

Let $R = \mathbb{Z}[x, y]$ and let $I = (x, y)$. Define a map

$$\phi(ax + by, a'x + b'y) = ad - bc \pmod{I}.$$

Prove that this is a well defined alternating map from $I \times I \to \mathbb{Z}$.

Problem 2 (DF, Problem 12, p. 455)

Let F be of characteristic 2 and let V be a vector space over F. Prove that an alternating bilinear map on F is symmetric, but that not every symmetric bilinear map is alternating.