Solve the following problems from Srednicki.

- 1 (10 points) Problem 39.1 on page 250.
- **2** (20 points) Problem 39.2 on page 250.
- **3** (20 points) Problem 39.3 on pages 250.
- ${\bf 4}$  (50 points) Problem 39.4 on pages 251.