1. Exercise 5.5 of the textbook.

2. Exercise 5.11-(1), (2) of the textbook.

3. Exercise 5.16 of the textbook (Hint: Use $V(x) = \int_0^x \sigma(y)dy + \frac{1}{2}(x_1^2 + x_2^2)$).

4. Exercise 5.18 of the textbook.