Hints for exercises in chapter 16

Exercise 16.2.1. Assume $(ab, p) = 1$; let d be the order of $p \pmod{b}$. Let $A = a \cdot (p^d - 1)/b$, and then $C = p^d - 1 - A$. Write $C \pmod{p^d}$ in base p as $c_0 + c_1 p + \cdots + c_{d-1} p^{d-1}$. Then $a/b = 1 + \sum_{j \geq 0} c_j p^j$ where $c_j = c_k$ when k is the least non-negative residue of $j \pmod{d}$.

Exercise 16.6.5(b). Use the identity $AB - 1 = (A - 1) + A(B - 1)$.

Exercise 16.7.2(a). Differentiate this expression.