Math 256B. Homework 9

Due Wednesday 3 April

1. Hartshorne III Ex. 5.8.

2. Let X be a projective scheme over a field k, and let $\mathscr{L}$ be a very ample line sheaf on X (over k). Show that there exists an integer m_0 such that the map

$$H^0(X, \mathscr{L}^{\otimes m})^{\otimes n} \to H^0(X, \mathscr{L}^{\otimes mn})$$

is surjective for all $m \geq m_0$ and all $n \in \mathbb{Z}_{>0}$.
[**Hint:** Look at the case $X = \mathbb{P}^r_k$ first.]

3. Hartshorne II Ex. 6.1. Also say what the isomorphism is.