ASSIGNMENT 3
DUE THURSDAY OCTOBER 22

(1) Consider $X = V_p(xt - yz) \subset \mathbb{P}^3$, the quadric in $\mathbb{P}^3$. Find a bijection between $\mathbb{P}^1 \times \mathbb{P}^1$ and X.

   Explain the relationship between this bijection and the following picture:

   `http://en.wikipedia.org/wiki/File:Ruled_hyperboloid.jpg`

(2) Problem 4 (The Space Cubic) on page 35 of Perrin, parts (a)-(c) (don't do (d), (e)).

(3) Problem 1 (Homogenisation and dehomogenisation) on page 66 on Perrin, all parts.

(4) Let R be any ring and let D be a multiplicative subset containing 1, not containing 0. Let $i : R \to R[D^{-1}]$ denote the canonical map.
   (a) Show that $I \to \langle i(I) \rangle$ gives a surjection from the ideals in R to the ideals in $R[D^{-1}]$.
   (b) Given an example to show that this is not a bijection.
   (c) Show that this does give a bijection between the prime ideals of R which are disjoint from D and the prime ideals of $R[D^{-1}]$.