

**SECOND HOMEWORK, DUE WEDNESDAY APRIL  
15TH**

1. Let  $H \subset \mathbb{P}^n$  be a hypersurface of degree  $d$ . Identify the linear system  $|H|$ . Is  $|H|$  base point free? What is its dimension?
2. Let  $C$  be a smooth curve and let  $p \in C$  be a point of  $C$ . Then  $h^0(C, \mathcal{O}_C(p)) > 1$  if and only if  $C \simeq \mathbb{P}^1$ .
3. Let  $C$  be a smooth curve of genus  $g$  and let  $D$  be a divisor of degree  $d$ . Show that if  $d > 2g$  then  $D$  is very ample. Give examples to show that this bound is sharp. Show that  $D$  is ample if and only if  $d > 0$ .