

## COMMUTATIVE ALGEBRA HW 11

JC

Due in class Wed 5 October.

- (1) Let  $I$  be an ideal which has a primary decomposition. Show that if  $I$  is radical then  $I$  has no embedded prime ideals.
- (2) Let  $R = \mathbb{Z}[x]$ . Let  $M = (2, t)_R$  and  $I = (4, t)_R$ . Show that
  - (a)  $M$  is maximal. Hint: what is  $R/M$ ?
  - (b)  $I$  is primary.
  - (c)  $\sqrt{I} = M$ .
  - (d)  $I \neq M^n$  for all  $n > 0$ .