

HW #4 due 4-25

Math 506A

1. Let R be a commutative ring, not necessarily Noetherian. By looking at contractions of prime ideals in $R[x]$, show that $\dim R + 1 \leq \dim R[x] \leq 2 \dim R + 1$, where \dim denotes the Krull dimension and $R[x]$ is the polynomial ring in x over R .
2. If R is Noetherian, show that $\dim R[x] = \dim R + 1$.
3. Exercise 15.4.26, p. 728.
4. Exercise 15.4.30, p. 729.
5. Exercise 15.4.31.

Find and read background material on dimensions of commutative rings.