

ALGEBRA 2 – PROBLEM SET 3 – UNIVERSITY OF PITTSBURGH, FALL 2019

Due on Friday September 20.

- (1) DF §7.3, Problem 34, with these caveats:
  - (a) Assume in addition that the ring  $R$  is commutative.
  - (b) Take note of the Definition on page 247 of DF.
- (2) DF §12.1, Problem 6.

Not to turn in, but please read for any new content. Of course, you can do them as exercises if you like! Contact me or your classmates if you would like to propose more interesting problems.

- (1) DF §12.1, Problem 5 (this is a useful warm-up for DF §12.1, Problem 6).
- (2) DF §12.1, Problem 13.
- (3) Let  $R$  be a commutative ring. See DF §7.3, Problem 29 to learn the the definition of the *nilradical* of a commutative ring. Prove that the intersection of all prime ideals of  $R$  is equal to its nilradical.