SIXTH HWK, DUE THURSDAY OCTOBER 30TH

Feel free to work with others, but the final write-up should be entirely your own and based on your own understanding.

1. (10 pts) (3.2.9), page 191.
2. (5 pts) (3.2.11), page 191.
3. (10 pts) (3.2.14), page 192.
4. (5 pts) (3.3.5), page 205.
5. (5 pts) (3.3.9), page 206.

Bonus Challenge Problems:

6. (5 pts) Let F be any field. Define a function

$$\phi \colon P(F) \longrightarrow P(F),$$

by the rule,

$$\phi(a_d x^d + a_{d-1} x^{d-1} + \cdots + a_0) = d a_d x^{d-1} + (d-1) a_{d-1} x^{d-2} + \cdots + a_1.$$

Show that

$$\phi(fg) = f\phi(g) + \phi(f)g,$$

where f and $g \in P(F)$.