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# Problem Set 7

## Due: Monday, October 22

Work all of the following problems. A subset of the problems will be graded. Be sure to adhere to the expectations outlined in the *General Problem Set Guidelines Sheet*.

Unless otherwise stated, all problems can be found in the appropriate *Exercises* sections of the text (*Abstract Algebra* by D. Dummit and R. Foote, 3rd Edition).

- Section 9.3 # 1
- Section 9.4 # 1, 2, 7, 9, 11, 12
- Determine if the following polynomials are irreducible in  $\mathbb{Q}[x]$ . If a polynomial is reducible, then determine its factorization into irreducibles.

(a)  $f(x) = x^5 + 6x^3 + x^2 + 2x + 1$

(b)  $f(x) = x^5 + x^4 + 4x^2 + x + 2$