W 6.1: 26 Let k be a field, and let $f(x)$, $g(x) \in k[x]$ be relatively prime and *monic*. Show that if $h(x)$ is *monic* and *irreducible* in $k[x]$ and $h^2|fg$ then $h^2|f$ or $h^2|g$.

W 7.2: 39 Let $f(x)$, $g(x) \in k[x]$ be *nonconstant* monic polynomials, where k is a field. Show that, if g is irreducible and every root of f (in an appropriate splitting field) is also a root of g, then $f = g^m$ for some integer $m \geq 1$. Hint: Use *strong* induction on $\deg(f)$ (not $\deg(h)$.)

D 8.2: 8 This problem references Example 8.12, which has a typo. The second step of the Euclidean algorithm should be:

$$z = (3 - i)(-10 + 15i) + (-4 - 7i)$$

The text has $(3 + 3i)$ instead of z, but this is a mistake.

W 8.4: 47 Referring to Example 8.52, (i) the ideal generated by the norms of *generators of* J_1 is an ideal in $\mathbb{Z}$, and hence principal. Find a generator for it. (ii) Do the same for the other ideals J_2, J_3, and J_4.