Let $R$ be a Euclidean domain.

1. For non-zero elements $f_0, f_1$ with $\sigma(f_0) \geq \sigma(f_1)$, write
   \[ f_0 = f_1 q_1 + f_2, \]
   where $\sigma(f_2) < \sigma(f_1)$. Show that
   \[ (f_0, f_1) = (f_1, f_2) \]
   as ideals in $R$.

2. Use this to find the greatest common divisor of 2210 and 78 (in $\mathbb{Z}$).

3. Describe an algorithm to find the gcd of any two elements in a Euclidean domain. (This technique is due to Euclid, though of course, he was only interested in the integers.)