can be calculated.

Now if $s_1 < s_2$ it is easy to see that $b_1 x^{s_1} d$ is the highest common factor of y_1, y_2. Further if $s_1 = s_2 = s$, the highest common factor of $b_1 x^{s_1}$ and $b_2 x^{s_2}$ (if it exists) must be of degree s in x. If $b_1 = c_1/d_1$ and $b_2 = c_2/d_2$ (we can assume $(c_i, d_i) = 1$ because of R being HCF) it can be verified that $((c_1, c_2)/[d_1, d_2])x^s d$ is the highest common factor of y_1, y_2, where $[d_1, d_2]$ denotes the least common multiple of d_1 and d_2.

If the case (b) holds let y_1 be of type (α) and y_2 be of type (β), that is $y_1 = b_1 x^{s_1}(1 + \sum_{j_1=1}^{n_1 - s_1} a'_{j_1} x^{j_1})$

$$y_2 = r_{02}(1 + \sum_{i_2=1}^{n_2} a'_{i_2} x^{i_2})$$

and if d is the HCF of the elements in the braces then $r_{02}d$ is the HCF of y_1 and y_2.

Finally if (c) holds let $y_1 = r_{01}(1 + \sum_{i_1=1}^{n_1} a'_{i_1} x^{i_1})$

$$y_2 = r_{02}(1 + \sum_{i_2=1}^{n_2} a'_{i_2} x^{i_2})$$

and if d is the HCF of the elements in the braces then $(r_{01}, r_{02})d$ is the HCF of y_1, y_2.

To sum up, each pair of non units in S has the highest common factor and this establishes the lemma.

Now let y be a general non zero non unit element in S then $y = r_0 + \sum_{i=1}^{n} a_i x^i$; $r_0 \in R$, $a_i \in K$, and y can be of two types;

$$(\alpha) \quad y = bx^s(1 + \sum_{j=1}^{n-s} a'_j x^j) \ ; \ b \in K, \text{ or}$$

$$(\beta) \quad y = r_0(1 + \sum_{i=1}^{n} a'_i x^i).$$