Step-1

(a)

Given statement is every basis for S can be extended to a basis for R^6 by adding one more vector.

The basis for S is a linearly independent set and we know that any linearly independent set in R^6 can be extended to a basis, by adding more vectors if necessary.

As, S is a five dimensional subspace of six dimensional vector space R^6, by adding one more vector, every basis for S can be extended to a basis for R^6.

Hence the given statement is $\boxed{\text{true}}$.

Step-2

(b)

Given statement that every basis for R^6 can be reduced to a basis for S by removing one more vector is false.

For example,

$$\beta = \left\{ \begin{matrix} (1,0,0,0,0,0),(0,1,0,0,0,0),(0,0,1,0,0,0)(0,0,0,1,0,0) \\ (0,0,0,0,1,0,)(0,0,0,0,0,1) \end{matrix} \right\}$$ is a basis for R^6

Let S be a subspace spanned by $(1,2,3,4,5,6)$.

Step-3

Therefore S is a subspace for R^6. But it is not by removing one of the bases

Vector, remaining those cannot span S. (Infact no vector in the basis is longs to S)

Therefore the given statement is $\boxed{\text{false}}$.