

## Critical Pairs:

- If  $l_1 \rightarrow r_1, l_2 \rightarrow r_2 \in \mathcal{R}$  (variable-renamed),  
 $\pi \in \text{Occ}(l_1)$  with  $l_1|_\pi \notin \mathcal{V}$  and  $\sigma = \text{mgu}(l_1|_\pi, l_2)$ ,  
then  $\langle r_1\sigma, l_1[r_2]_\pi\sigma \rangle$  is a *critical pair* of  $\mathcal{R}$ .
- $l_1 \rightarrow r_1, l_2 \rightarrow r_2$  may be equal up to variable renaming.  
Then we only regard  $\pi \neq \epsilon$ .
- $CP(\mathcal{R}) =$  set of critical pairs of  $\mathcal{R}$ .

$$\begin{array}{ccc} & l_1\sigma = l_1[l_2]_\pi\sigma & \\ & \swarrow \quad \searrow & \\ r_1\sigma & & l_1[r_2]_\pi\sigma \end{array}$$

## Critical Pair Lemma

$\mathcal{R}$  is locally confluent iff all its critical pairs are joinable.