

## Closure Properties of Languages

<i>Property</i>	<i>Regular</i>	<i>CFL</i>	<i>DCFL</i>	<i>CSL</i>	<i>Recursive</i>	<i>RE</i>
Union	Yes	Yes	No	Yes	Yes	Yes
Intersection	Yes	No	No	Yes	Yes	Yes
Set Difference	Yes	No	No	Yes	Yes	No
Complementation	Yes	No	Yes	Yes	Yes	No
Intersection with a regular lang.	Yes	Yes	Yes	Yes	Yes	Yes
Concatenation	Yes	Yes	No	Yes	Yes	Yes
Kleen Closure	Yes	Yes	No	Yes	Yes	Yes
Kleen Plus	Yes	Yes	No	Yes	Yes	Yes
Reversal	Yes	Yes	Yes	Yes	Yes	Yes
Homomorphism	Yes	Yes	No	No	No	Yes
$\epsilon$ -free Homomorphism	Yes	Yes	No	Yes	Yes	Yes
Inverse Homomorphism	Yes	Yes	Yes	Yes	Yes	Yes
Substitution	Yes	Yes	No	No	No	Yes
$\epsilon$ -free Substitution	Yes	Yes	No	Yes	Yes	Yes
Right Quotient with a regular lang.	Yes	Yes	Yes	No	-	Yes
Left Quotient with a regular lang.	Yes	Yes	Yes	No	-	Yes