

## Homework 5

1. Define the following regular expressions

$r^+$	(one or more matches)
$r^?$	(zero or one match)
$r^{\{n\}}$	(exactly $n$ matches)
$r^{\{m,n\}}$	(at least $m$ and maximal $n$ matches, with the assumption $m \leq n$ )

in terms of the usual regular expressions

$$r ::= \emptyset \mid \epsilon \mid c \mid r_1 + r_2 \mid r_1 \cdot r_2 \mid r^*$$

2. Recall the definitions for  $Der$  and  $der$  from the lectures. Prove by induction on  $r$  the property that

$$L(der\ c\ r) = Der\ c\ (L(r))$$

holds.