What are the identity rules for regular expression?

The two regular expression's P and Q are equivalent (denoted as P=Q) if and only if P represents the same set of strings as Q does.

For showing the equivalence of two regular expressions we need to show some identities of regular expression's

Let P, Q and R be the regular expressions then the identity rules are as follows −

- εR=R ε=R
- ε*= ε ε is null string
- (Φ)*= ε Φ is empty string
- ΦR=R Φ= Φ
- Φ+R=R
- R+R=R
- RR*=R*R=R+
- (R*)*=R*
- E+RR*=R*
- (P+Q)R=PR+QR
- (P+Q)*=(P*Q*)*=(P*+Q*)*
- R*(ε+R)=(ε+R)R*=R*
- (R+ε)*=R*
- E+R*=R*
- (PQ)*P=P(QP)*
- R*R+R=R*R