

# 1 Patch properties

Darcs is built on a hierarchy of patch types. At the lowest level are “primitive” patches, and from these building blocks, a whole hierarchy of patch types are built. Each of these patch types must support a number of functions, which must obey a number of laws.

## 1.1 Properties of identity

**Property 1 (Identity commutes trivially)** *The identity patch must commute with any patch without modifying said patch.*

**Property 2 (Inverse doesn’t commute)** *A patch and its inverse will always commute, unless that patch is an identity patch (or an identity-like patch that has no effect).*

## 1.2 Commute properties

**Property 3 (Recommute)**  $AB \longleftrightarrow B'A'$  if and only if  $B'A' \longleftrightarrow AB$

**Property 4 (Commute inverses)**  $AB \longleftrightarrow B'A'$  if and only if  $B^{-1}A^{-1} \longleftrightarrow A'^{-1}B'^{-1}$

**Property 5 (Patch and inverse)** If  $AB \longleftrightarrow B'A'$  then  $A^{-1}B' \longleftrightarrow BA'^{-1}$

This property is only true of primitive patches.

**Property 6 (Permutivity)** *(to be added...)*