"The Bull Dozer" a method for proving or disproving any equivalence btw Boolean expressions.

* The expansion trick = convert a product into the sum of fully populated product terms.
* The sum of two terms is their OR.
* A product term is the AND of variables (or their negation)
  e.g. $A'BC$ is, $A'(B+C)$ is not
* The set of variables that appear in an expression is called the Population
* A fully populated product term is a product term that contains all the variables (or their negation) in the population.

Ex: Prove $\underline{A'B'C'} + \underline{B'C} + \underline{ABC} = \underline{A'B'} + \underline{AC}$ Population = {A, B, C}

① Expand to SOP
② Add missing
Law 1D
Law 5
make fully populated product term
③ Eliminate duplicate products
Law 3
④ Rewrite order
Law 6

$A'B'C' + 1B'C + ABC = A'B'1 + A1C$

$A'B'C' + (A+A')B'C + ABC = A'B'(C+C') + A(B+B')C$

$A'B'C' + AB'C + A'B'C + ABC = \underset{③}{A'B'C} + \underset{①}{A'B'C'} + \underset{④}{ABC} + \underset{②}{AB'C}$

$A'B'C + AB'C + A'B'C + ABC$

Proof now flows down then up

Exception when multiplying out is a big pain

Rare

$$(A+B)(A'+B)(B+C) \quad = \quad B$$

$$((A+B)(A'+B)(B+C))'' \quad = \quad (B')'$$

$$((A+B)' + (A'+B)' + (B+C)')' \quad = \quad (\underbrace{AB'C}_{3} + \underbrace{AB'C'}_{4} + \underbrace{A'B'C}_{1} + \underbrace{A'B'C'}_{2})'$$

$$(A'B' + AB' + B'C')'$$

$$(A'B'C + \underline{A'B'C'} + AB'C + \underline{AB'C'} + \cancel{AB'}C' + \cancel{A'B'}C')'$$