

Two Distributive Laws If  $B$  is an event and  $A_1, A_2, \dots$  are events

$$\textcircled{1} \left( \bigcup_j A_j \right) \cap B = \bigcup_j (A_j \cap B)$$

an outcome is in  $\bigcup_j A_j \cap B$  if it is in  $B$  and in at least one of the  $A_j$ 's. Equivalently, it is in at least one  $A_j \cap B$

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$$\textcircled{2} \left( \bigcap_j A_j \right) \cup B = \bigcap_j (A_j \cup B)$$

an outcome is in here

outcomes in  $B$  or all of the  $A_j$ 's.

if it is in  $B$  or all of the  $A_j$ 's (or both)