1 Missionaries and Cannibals

Three missionaries and three cannibals must cross a river using a boat which can carry at most two people, under the constraint that, for both banks, if there are missionaries present on the bank, they cannot be outnumbered by cannibals (if they were, the cannibals would eat the missionaries). The boat cannot cross the river by itself with no people on board.

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2 Some math

- $\mathcal{M}$, the set of missionaries
- $\mathcal{C}$, the set of cannibals
- $\mathcal{B} = \{E, W\}$, the banks of the river

It is helpful to realize that everyone is the union of $\mathcal{M}$ and $\mathcal{C}$.

$$\mathcal{E} = \mathcal{M} \cup \mathcal{C}$$

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3 Describing the boat and who is on each bank

- b is the bank where the boat is

$$b \in \mathcal{B} = \{E, W\}$$

- $o(b)$, the other bank

b	$o(b)$
E	W
W	E
