Question 2

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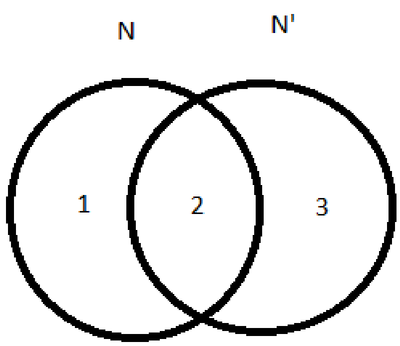
2. In the above example, we had $|N| = 2, |N'| = 3, |N \cap N'| = 1$**, and** $|N \cup N'| = 4$. **It is no coincidence that** $2 + 3 = 1 + 4$; **in fact, for any sets** N **and** N', **it is always true that** $|N| + |N'| = |N \cap N'| + |N \cup N'|$. **Why? Draw**



$|N| + |N'| = (1) + (2) + (2) + (3)$ ______________ (a)

$|N \cap N'| + |N \cup N'| = (2) + (1) + (2) + (3)$

$|N \cap N'| + |N \cup N'| = (1) + (2) + (2) + (3)$ ______________ (b)

$From (a) and (b),$

$|N| + |N'| = |N \cap N'| + |N \cup N'|$