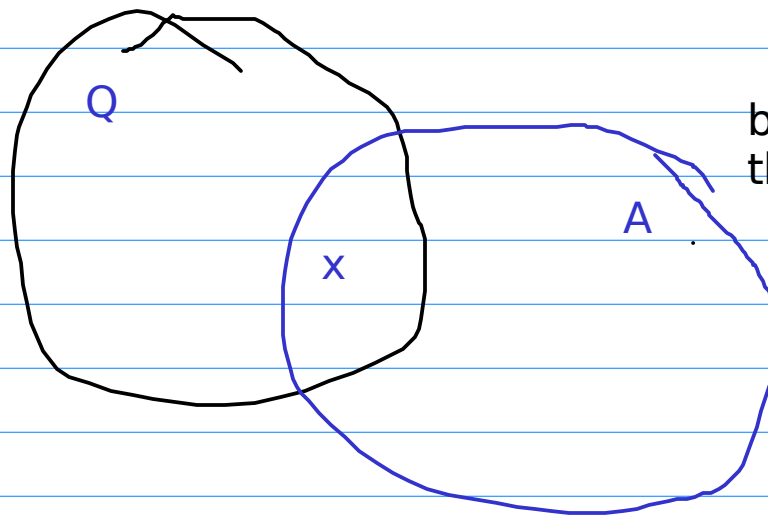


black circle is cards that are HEARTS



blue circle is cards that are aces

we're talking about a deck of cards

$$P(Q) = 1/4 \quad P(A) = 1/13$$

x is cards that are both hearts and aces (that is, 1 card)

$$p(x) = 1/52$$

Q is the set of heart cards. A is the set of ace cards.

$Q \cap A$ is the intersection of those 2 sets.

$Q \cup A$ is the union of those 2 sets.

$$P(Q \cup A) \text{ "union"} = P(Q) + P(A) - P(Q \cap A) = 1/13 + 1/4 - 1/52 = 16/52$$

This is boolean algebra, set theory.

