

### Exercise 1A.1

A deck of cards has 52 total cards:  $\{A, K, Q, J, 10, 9, 8, 7, 6, 5, 4, 3, 2\}$  in each of 4 suits: {diamonds  $\diamond$ , hearts  $\heartsuit$ , spades  $\spadesuit$ , clubs  $\clubsuit$ }.

Diamonds and hearts are red, spades and clubs are black.

You randomly draw 1 card from the deck. Define:

$A$  = event that the card is a king (K)

$B$  = event that the card is a “face card” (J, Q, or K)

$C$  = event that the card is “red” (either hearts or diamonds)

(a) What is the complement of  $C$ ?

(b) Are any of these events disjoint?

(c) Is  $A$  a subset of  $B$  or  $B$  a subset of  $A$ ?

(d) What is  $A \cap B$ ?

(e) How many outcomes (cards) are in  $A \cap B \cap C$ ?