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 ♢, hearts ♡, spades ♠, clubs ♣}.

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?

card is black ("not red")

(b) Are any of these events disjoint?

no

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

A a subset of B

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

card is a king (event A)

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

$A \cap B \cap C$ = "red king" = {♢K, ♡K} = 2 possible outcomes