1. Find the union C1 ∪ C2 and the intersection C1 ∩ C2 of the two sets C1 and C2, where

(a) C1 = {0, 1, 2}, C2 = {2, 3, 4}.

(b) C1 = {x : 0 < x < 2}, C2 = {x : 1 ≤ x < 3}.

(c) C1 = {(x, y) : 0 < x < 2, 1 < y < 2}, C2 = {(x, y) : 1 < x < 3, 1 < y < 3}.

 2. Suppose C1, C2, C3,… is a nondecreasing sequence of sets, i.e., Ck ⊂ Ck+1,

for k = 1, 2, 3, . . . Then Ck is defined as the union C1 ∪C2 ∪C3∪· · ·. Find

Ck if

(a) Ck = {x : 1/k ≤ x ≤ 3 − 1/k}, k = 1, 2, 3, . . . .

(b) Ck = {(x, y) : 1/k ≤ $x^{2}+y^{2}$≤ 4 − 1/k}, k = 1, 2, 3, . .

1. A random experiment consists of drawing a card from an ordinary deck of 52 playing cards. Let the probability set function P assign a probability of  to each of the 52 possible outcomes. Let C1 denote the collection of the 13 hearts and let C2 denote the collection of the 4 kings. Compute P(C1), P(C2), P(C1 ∩C2), and P($C\_{1}∪C\_{2}$).
2. A person has purchased 10 of 1000 tickets sold in a certain raﬄe. To determine the ﬁve prize winners, ﬁve tickets are to be drawn at random and without replacement. Compute the probability that this person wins at least one prize. Hint: First compute the probability that the person does not win a prize.