Ex1, From a standard deck of 52 cards, 1 card is randomly selected. Find the probability that
(a) the card is a heart.
(b) the card is a face card. (J, Q, K)
(c) the card is either a heart or a face card.
(d) the card is a heart and a face card at the same time. (heart face card)
(e) the card is either a face card or a 10
(f) the card is a 5 card or a spade.
(g) the card is 5 spade.

Ex2, 1 red die and 1 blue die are rolled. (2 dice rolled.)
(a) Sum of the rolls is 9.
(b) both same rolls
(c) At least one die is 5
(d) At lease one die is 5 or 6
(e) At least one die is even
(f) No 5 nor 6.
(g) Not both 5 or 6. (at least one roll is 1, 2, 3, or 4)

Def Events E and F are mutually exclusive if $E \cap F = \{\}$ (same as $n(E \cap F) = 0$, same as $P(E \cap F) = 0$)

Thm Let $S$ be a sample space and $E$ and $F$ be events.

(1a) $n(E \cup F) = n(E) + n(F) - n(E \cap F)$. (Inclusion Exclusion Principle - Set Form)
(1b) $P(E \cup F) = P(E) + P(F) - P(E \cap F)$. (Inclusion Exclusion Principle - Probability Form)
(1c) If $E$ and $F$ are mutually exclusive, then $P(E \cup F) = P(E) + P(F)$.
(2a) $n(E^c) = n(S) - n(E)$ (Complementary Event)
(2b) $P(E^c) = P(S) - P(E)$ (Complementary Probability)
Ex3, There are 200 students. 80 students are taking English and 70 students taking math. 30 students taking both math and English. If one student is selected randomly, find the probability that the student selected takes 
(a) math
(b) English
(c) both math and English
(d) math but not English
(e) no math
(f) no math nor English

Ex4, From a standard deck of 52 cards, 2 cards is randomly selected. Find the probability that 
(a) both cards are hearts.
(b) both cards are Aces.
(c) at least one card is an Ace.
(d) both are same suit.
(e) the 2 cards form a pair.
(f) there are no Aces.
(g) one card is an Ace and the other is a K.

Ex5, 1 red die, 1 blue die, and 1 white die are rolled. (3 dice rolled.)
(a) Sum of the rolls is 9.
(b) all same rolls
(c) At least one die is 5
(d) At least one die is 5 or 6
(e) At least one die is even
(f) No 5 nor 6.
Ex6, A bag contains 3 green balls, 2 yellow balls, and 4 red balls.  
2 balls are selected randomly, find the probability that
(a) 2 balls are green
(b) 2 balls are yellow
(c) there is no green
(d) at least one is green
(e) there is one green and one red
(f) not both are green (= at least one ball is not green)
(g) the 2 balls are different colors

Ex7, A bag contains 3 green balls, 2 yellow balls, and 4 red balls.  
3 balls are selected randomly, find the probability that
(a) 3 balls are green
(b) 2 balls are yellow
(c) there is no green
(d) at least one is green
(e) there is one green and one red
(f) not all are green (= at least one ball is not green)
(g) the 3 balls are all different colors