1   Question 3.2

A true-false test has 20 questions.

a) Dev hasn't studied at all, so he guesses each answer by tossing a coin. Let R be the number of questions that Dev gets right. Find $P(R > 16)$.

b) Aram, Chendi, and Samir haven't studied either. So each of them also guesses every answer by tossing a coin. What is the chance that none of them gets more than 16 questions right?

2 Question 3.4

Akaash bets a dollar repeatedly on a "split" at roulette.

- Each time he bets, his chance of winning is 2/38 independently of other times.

- Each time he wins a bet, his net gain is 17 dollars.

- Each time he loses a bet, he loses a dollar; that is, his net gain is 1 dollars.

Suppose he bets 90 times. What is the chance that he makes money? In other words, what is the chance that his total net gain is positive?

3   Question 3.5

A standard deck consists of 52 cards. Each card has a color, a suit, and a rank, as follows.

There are 13 cards in each of four suits: hearts, diamonds, spades, and clubs. Hearts and diamonds are red. Spades and clubs are black. In each suit, the cards are of 13 ranks: Ace, 2, 3, . . . , 10, Jack, Queen, King. The Jacks, Queens, and Kings are called face cards. Throughout this course, "dealt" means "sampled at random without replacement".

A bridge hand consists of 13 cards dealt from the deck.

   a) Find the chance that the hand contains two aces.

   b) Find the chance that the hand contains more than two aces.

   c) Find the chance that the hand contains six face cards.