

No Calculators! Because you don't have a calculator you don't need to simplify any answers.

1. You are dealt 5 cards from a deck of 52. The first two cards are an Ace and a King. What is the probability that you will complete the A-K-Q-J-10 straight (suits do not matter)?

2. In Europe, 90% of all households have a television. 50% of all households have a television and DVD player. 1% of all households own a DVD player, but not a television.
 - a) What is the probability that a household has a DVD player, given that it has a television?

 - b) Are the events owning a television and owning a DVD player independent events or not? Show your work to support your answer.

3. Jar A has 3 blue and 2 green marbles, and Jar B has 1 blue and 4 green marbles. A random marble is drawn from Jar A and placed in Jar B. Then a random marble is drawn from Jar B. [6]
 - a) Draw a tree diagram of the given information.

 - b) $P(\text{the second marble is green}) =$

 - c) $P(2^{\text{nd}} \text{ marble is green} \mid 1^{\text{st}} \text{ marble was blue}) =$

 - d) $P(1^{\text{st}} \text{ marble is blue} \mid 2^{\text{nd}} \text{ marble was green}) =$

4. A factory produces components of which 1% are defective. The components are packed in boxes of 10. A box is selected at random.

- a) Find the probability that the box contains exactly one defective component.
- b) Find the probability that there are at least 2 defective components in the box.

5. Three horses, A, B, and C, compete in four races. Assuming that each horse has equal chance of winning in each race,

a) what is the probability that A wins two races and B and C win one race each?

b) what is the probability that the same horse wins all four races?

6. Big Al has a game where he tosses three fair coins in the air. You receive \$8 if three heads appear, \$4 if two heads appear, \$2 if one head appears, and \$1 if no heads appear. It costs \$5 to play his game. What is the expected value of playing this game? Explain why you should or should not play this game?