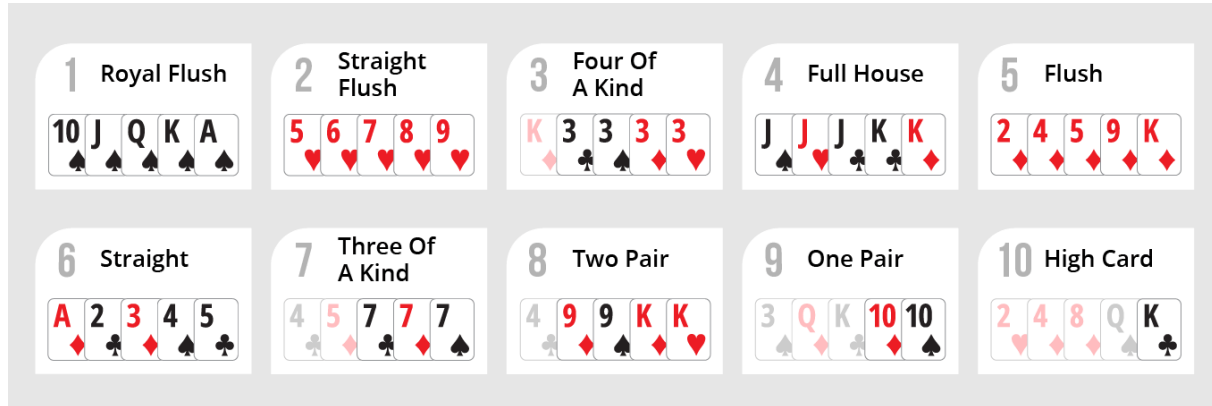


Instructions: Show ALL work neatly for full credit.

1. In poker, there are 10 possible types of 5-card poker hands, as shown in class. For each type, give a formula that gives the total number of hands with that rank. Furthermore (and this is the important part), explain why that formula gives the right number.

TYPES OF POKER HANDS



Note: Be careful not to overcount. When counting flushes for example, you have to make sure to exclude straight flushes and royal flushes which are STRONGER hands.

2. For each situation below, you are betting one dollar on the outcome of the roll of two dice. In each case, determine the expected value of your bet, and whether or not the bet is favourable. Make sure to properly justify your answer.
- (a) If both dice are sixes, you win \$6.
If exactly one of the dice is a 6, you lose your \$1.
Otherwise (if none of the dice are sixes), it's a draw, and no money is exchanged.
- (b) If the PRODUCT of the numbers on the dice is odd, you win \$2.
Otherwise (i.e. if the product is even), you lose your \$1.
3. In a game of American Roulette, you like to bet on lucky number 7. What is the probability of showing a profit after you've bet a dollar on that same number 35 times in a row? Given the answer, why is this not a viable strategy to win at roulette?