



Your Names: _____ Game Serial # _____
 (print clearly) _____

Game: Use provided spreadsheet or a deck of cards with four suit colors (*Red, Green, Blue, Yellow*) and numbers 1-5, (20 cards total).
 Deal two hands of three cards: one with two cards face up and one card face down, and the other with one card face up and two cards face down.
 For first round, calculate probabilities of outcomes and enter in tables below.
 Group decides which hand is likely to be the best.
 See next page for ranks of hands and odds of hands.
 Turn over the face-down cards and score:
 two points if group guesses which is high hand correctly,
 one point if hands are tied, and
 no points if group guesses which is high hand incorrectly.
 Group tries to maximize points per round over 10 rounds.

Hands: Straight = #'s in order, e.g., 1,2,3;
 Flush = all same suit, e.g., Y,Y,Y;
 3-of-kind = 3 same #, e.g., 2,2,2

Round 1: hand with two cards face up Write up-card #'s, suits here

| $P(\text{straight flush})$ | $P(\text{3-of-kind})$ | $P(\text{flush})$ | $P(\text{straight})$ | $P(\text{pair})$ | $P(\text{low hand})$ |
|----------------------------|-----------------------|-------------------|----------------------|------------------|----------------------|
| | | | | | |

Round 1: hand with one card face up Write up-card #, suit here

| $P(\text{straight flush})$ | $P(\text{3-of-kind})$ | $P(\text{flush})$ | $P(\text{straight})$ | $P(\text{pair})$ | $P(\text{low hand})$ |
|----------------------------|-----------------------|-------------------|----------------------|------------------|----------------------|
| | | | | | |

Your Team Points Scored:

| | | | | | | | | | | |
|-------|--|--|--|--|--|--|--|--|--|--|
| Round | | | | | | | | | | |
| Pts | | | | | | | | | | |

Tot pts scored:

TABLE I
 ODDS OF GETTING HANDS (ONE 3-CARD HAND, BEFORE BEING DEALT)
 (FROM BEST HAND TO WORST HAND)

| Hand | # of such hands | Explanation |
|---------------------------|--|---|
| 3 cards straight flush | $4 \cdot 3 = 12$ | 4 suits, 3 ways to get 3-in-row: 123, 234, 345; |
| 3 of same # (3-of-a-kind) | $5 \cdot {}_4C_3 = 20$ | 5 #'s, use 3 of the 4 of that # |
| 3 of same suit (flush) | $4 \cdot {}_5C_3 - 4 \cdot 3 = 28$ | 4 suits, 3 of 5 cards in suit used, minus straight flush |
| 3 in a row (straight) | $3 \cdot 4^3 - 3 \cdot 4 = 180$ | 3 ways to get 3-in-row: 123, 234, 345; 4 suit choices each card, minus straight flush |
| 2 of same # (pair) | $5 \cdot {}_4C_2 \cdot 16 = 480$ | 5 #'s for pair (pair means not flush), use 2 of 4 suits of that #, 16 cards for 3rd card (to not get 3 of kind) |
| Low hand | ${}_{20}C_3 - \text{better hands} = 420$ | all remaining hands |

Number of possible hands (one 3-card hand): $N = {}_{20}C_3 = \frac{20!}{(20-3)!3!} = \frac{20 \cdot 19 \cdot \cancel{18}^3}{\cancel{3} \cdot \cancel{2} \cdot \cancel{1}} = 1140$