THREE CARD POKER

1. Total Hands: \( \binom{52}{3} = 22100 \)

2. Straight Flushes: \( 12 \times 4 = 48 \)

3. Trips (three of a kind) \( 13 \times \binom{4}{3} = 52 \)

4. Straights: \( 12 \times (4^3 - 4) = 720 \)

5. Flushes: \( \binom{13}{3} \times 4 - 48 = 1096 \)

6. Pairs: \( 13 \times \binom{4}{2} \times 48 = 3744 \)

7. Ace High: \( \left( \binom{12}{2} - 2 \right) \times (4^3 - 4) = 3840 \)

8. King High: \( \left( \binom{11}{2} - 1 \right) \times (4^3 - 4) = 3240 \)

9. Queen High: \( \left( \binom{10}{2} - 1 \right) \times (4^3 - 4) = 2640 \)

10. Dealer Qualifier (Queen High or better): 16380

11. When to bet: Let \( q \) be the probability that the dealer does not qualify, and \( p \) be the probability that we can beat the dealer’s hand. Then, the required condition to bet is

\[
(+1)q + (+2)p + (-2)(1 - p - q) \geq -1
\]

which simplifies to

\[
p \geq \frac{1 - 3q}{4}
\]

which means that the hand must beat 1235 hands. This requires Q9x or better, under the simplifying assumption that the dealer uses a separate deck.