

Quiz 2

Prob-Stats 3350
 Fall 2008, R. Sinn

Name _____

Directions

- Please show all work.
- You may use the graphing calculator of your choice.
- Provide EXACT representations of your probabilities as well as ESTIMATES.

1. **Verify [3 pts]:** Hero holds 85o preflop. Odds against flopping a straight are 1225 to 1.

Solution: Possible straights are made with flops of 9 6 7 and 6 7 4.

$$P(967) = \frac{\binom{4}{1}^3}{\binom{50}{3}} = \frac{4}{1225}, \text{ which is the same for } 674, \text{ so } \frac{8}{1225} \approx 0.00653.$$

$$\text{Odds: } 1225 \text{ to } 8 \Rightarrow \frac{1225-8}{8} = \frac{1217}{8} \approx 152.13 \text{ to } 1.$$

2. **[7 pts]:** Calculate the probability of (a) having a pocket pair (pp) preflop in Holdem. Then find the probability of being dealt (b) 5 pp's in a row, (c) 3 pp's in the next 10 hands, and (d) no more than 4 pp's in the next 10 hands.

Solution: (a) $P(\text{pp}) = \frac{\binom{13}{1}\binom{4}{2}}{\binom{52}{2}} = \frac{1}{17}$. Use the binomial theorem with $x = \frac{1}{17} \approx 5.8824 \times 10^{-2}$.

$$(b) \quad P(5 \text{ pp's in } 5 \text{ trials}) = \left(\frac{1}{17}\right)^5 = \frac{1}{1419857} \approx 7.0430 \times 10^{-7}$$

$$(c) \quad P(3 \text{ pp's in } 10 \text{ trials}) = \binom{10}{3} \left(\frac{1}{17}\right)^3 \left(\frac{16}{17}\right)^7 = 1.5978 \times 10^{-2}$$

$$(d) \quad P(4 \text{ or fewer pp's in } 10 \text{ trials}) = \sum_{k=0}^4 \binom{10}{k} \left(\frac{1}{17}\right)^k \left(\frac{16}{17}\right)^{10-k} \approx$$

0.99986