

Case 1

Issued: Friday, January 9, 2015

Due: Friday, January 16, 2015

Notes: This case contains seventeen (17) questions and are labeled as (1.1) through (4.5). Please answer all questions concisely and show all work. State any assumptions you are making. This case is graded pass/fail where a passing grade is 10/17 points. Partial credit will be awarded for incorrect answers with appropriate work shown. Using approximations is acceptable.

Scenario: It is Friday, May 30, 2014 and you are returning for the second day of the World Series of Poker (WSOP) Event #3 \$1000 No-Limit Hold'em. There are 186 of 2,224 players remaining and you have 63,500 chips, making you 26th of 186 overall at the start of Day 2. You are entering a new table and have no reads. You are already in the money, but the differences between payoffs are immaterial to you until the final table (so act in a way that maximizes expected chips for that hand).

The table is 8-handed as follows. Blinds are 600/1200 with 200 antes. You are on the button and will be in that position for all questions, although chip amounts will vary slightly as the day progresses.

Seat	Name	Chip Count
1	SB	22,800
2	[Empty]	N/A
3	BB	17,900
4	UTG	32,400
5	UTG+1	25,800
6	MP1	10,000
7	MP2	29,100
8	CO	77,100
9	Hero	63,500

Hand 1:

UTG+1: 25,800 M = 7.59
MP1: 10,000 M = 2.94
Hero (BTN): 63,500 M = 18.68

Pre Flop: (3,400) Hero is BTN with A♣ 9♥
1 fold, UTG+1 raises to 3,600, *1 fold*, MP2 calls 3,600, *1 fold*, Hero calls 3,600, 2
folds

Flop: (14,200) 2♣ T♣ K♣ (3 players)
UTG+1 bets 3,000, *MP2 folds*, Hero...

Question 1:

Assumptions: UTG+1 will bet again on the turn, except if it's a club, in which case he will check/fold to any bet.

What hand is the Hero drawing to? (1.1)

Flush

How likely is he to hit his draw on the next card, or the next two cards? (1.2)

Quick rule: $9 * 2\% = 18\%$ for one card, or $9 * 4\% = 36\%$ for two cards

Exact: $9/47 \approx 19\%$ for one card or $1 - (38/47 * 37/46) \approx 35\%$ for two cards

What percentage of the pot is the Hero contributing to see another card? (1.3)

$3,000/20,200 \approx 15\%$

Should the Hero make this call? Approximately what is the EV of this call? (1.4)

Yes, call

If one card: $EV \approx 19\% * 17,200 - 81\% * 3,000 = 838$

If two cards: $EV \approx 35\% * 17,200 - 65\% * 3,000 = 4,070$

What is the largest bet that the Hero can profitably call? (1.5)

If one card: $x/(14,200+2x) = 19\%$ when $x = 4,350$

If two cards: $x/(14,200+2x) = 35\%$ when $x = 16,550$

Hand 1 (continued):

UTG+1: 25,800 M = 7.59
MP1: 10,000 M = 2.94
Hero (BTN): 63,500 M = 18.68

Pre Flop: (3,400) Hero is BTN with A♣ 9♥

1 fold, UTG+1 raises to 3,600, *1 fold*, MP2 calls 3,600, *1 fold*, Hero calls 3,600, *2 folds*

Flop: (14,200) 2♣ T♣ K♣ (3 players)

UTG+1 bets 3,000, *MP2 folds*, Hero calls 3,000

Turn: (20,200) 5♦ (2 players)

UTG+1 bets 9,000, Hero...

Question 2:

Assumptions: UTG+1 will bet/call any size bet on the river, regardless of the board.

How likely is the Hero to hit his draw on the river? (2.1)

Flush Draw $9/46 = 19.6\%$ (18% quick rule)

What percentage of the pot is the Hero contributing to see another card? (2.2)

$9,000/38,200 \approx 23.6\%$

How much does the Hero have to make on the river to make this a profitable call?
Is this realistic? (2.3)

If only flush is good, pot needs to be $9,000/19.6\% \approx 45,900$, or 7,700 more (quick rule $9,000/18\% \approx 50,000 - 38,200 = 11,800$)

Villain has 10,000 left after this bet, so if you used the quick rule, then it's not realistic, but if you solved exactly, then it probably is (7,770 more vs 11,800 more)

Later in the day, MP1 has been eliminated and has been replaced by a short stack. Your reads are that UTG+1 and BB are aggressive and loose callers. You have identified SB as weak/tight. Chip stacks are as follows.

Seat	Name	Chip Count
1	SB	19,500
2	MP1	4,200
3	BB	5,500
4	UTG	38,600
5	UTG+1	13,200
6	[Empty]	N/A
7	MP2	33,100
8	CO	90,500
9	Hero	78,200

Hand 2:

Hero (BTN): 78,200 M = 23.00
SB: 19,500 M = 5.74

Pre Flop: (3,400) Hero is BTN with $5\heartsuit 6\spadesuit$
4 folds, Hero raises to 3,600, SB calls 3,000, *1 fold*

Flop: (10,000) $4\clubsuit 7\spadesuit K\heartsuit$ (3 players)
SB checks, Hero bets 6,000, SB...

Question 3:

Assumptions: SB will call with a two pair or better. If he calls, he will check the turn on any card.

What is the Hero's fold equity if the SB folds 70% of the time? (3.1)

$$70\% * 10,000 - 30\% * 6,000 = 5,200$$

What is the Hero's EV-if-called after this bet? (3.2)

**Hero's equity vs 74/K7/K4/44/77/KK is 29% (quick rule $8 * 4\% = 32\%$)
EV = $16,000 * 29\% - 6,000 * 71\% = 380$ (i.e. we prefer a call)**

Is the Hero's bet +EV? (3.3)

$$\text{Yes, EV} = 70\% * 10,000 + 30\% * [16,000 * 29\% - 6,000 * 71\%] = 7,114$$

What percentage of the time does SB have to fold to make this bet +EV? (3.4)

**EV = 0 = F * 10,000 + (1-F) * [16,000 * 29% - 6,000 * 71%] at F < 0%
We have the pot odds to see two more cards, so it's profitable if he calls 100%**

Hand 2 (continued):

Hero (BTN): 78,200 M = 23.00
SB: 19,500 M = 5.74

Pre Flop: (3,400) Hero is BTN with $5\heartsuit 6\spadesuit$
4 folds, Hero raises to 3,600, SB calls 3,000, *1 fold*

Flop: (10,000) $4\clubsuit 7\spadesuit K\heartsuit$ (3 players)
SB checks, Hero bets 6,000, SB raises to 15,700 all in, Hero...

Question 4:

What hand is the Hero drawing to? (4.1)

Straight

How likely is he to hit his draw on the next two cards? (4.2)

$$1 - (39/47 * 38/46) \approx 31\% \text{ (quick rule } 8 * 4\% = 32\%)$$

What percentage of the pot is the Hero contributing to see another two cards? (4.3)

$$9,700/41,400 \approx 23\%$$

Should the Hero make this call? Approximately what is the EV of this call? (4.4)

$$\text{Yes, EV} = 31,700 * 31\% - 9,700 * 69\% = 3,134$$

What is the largest raise that the Hero can profitably call? (4.5)

$$x/(22,000 + 2x) = 31\% \text{ when } x \approx 17,947$$

MIT OpenCourseWare
<http://ocw.mit.edu>

15.S50 Poker Theory and Analytics
January IAP 2015

For information about citing these materials or our Terms of Use, visit: <http://ocw.mit.edu/terms>.