Practice Pot Odds and Expected Value Problems

Pot Odds on the River

There is $500 in the pot and your opponent bets $300 on the river. What percent of the time do you need to have the winning hand in order to justify a call?

All In?

You have $50 remaining in a cash game and you flop a small flush draw. There is $30 in the pot and your opponent goes all in. Should you call with your flush draw? The only way you can win is to hit the flush on the turn or the river.

Implied Odds on the Turn

There is $500 in the pot. You have $500 remaining and your opponent has $500 remaining. He bets $200 of his $500 on the turn. You believe that if you "suck out" on the river you will be able to get him to put in the last $300 and if you "miss" on the river, you won't put in another penny. What chance do you need to hit your hand on the river to justify calling the $200 bet on the turn?

Reverse Odds

There is $50 in the pot. You know you have the best hand. Your opponent has $100 and you have $100 remaining. You believe that your opponent is on a flush draw after the turn, and can only win if he hits the flush on the river. If he calls your bet and makes his flush, you will lay your hand down and not lose any money on the river. If he misses his flush, he won't put in any more money.

What is the minimum you should consider betting to give him break even odds on his call?

Bonus Question: If you go all in and he calls, how big a mistake did he make? (Hint: Use Expected Value calculation)

Bluffing Expected Value

You sense some weakness from your opponent, but you missed your draw and can't win the pot without bluffing. There is $300 in the pot. You believe that a bluff of $200 will work about 30% of the time. Should you make the bluff?

Pot Odds and Expected Value Answers

Pot Odds on the River

$500 in the pot + $300 bet + $300 call = $1100 total pot if you call.

You put in $300 of the $1100, so you need a $300 / $1100 chance to win.

$300 / $1100 = 0.272 = 27.2%

You need a 27.2% chance or greater of winning to justify the call.

All In?

First, use the Rule of Four. You have 9 outs with two cards to come. 9 x 4 = 36%. You have about a 36% chance of making your flush and winning the pot.

$30 (pot) + $50 (his bet) + $50 (your call) = $130 total pot.

You have to call $50 to win $130.

$50 (your call) / $130 (total pot after your call) = 38%

So, by a slim margin, you should fold.

Implied Odds on the Turn

You are calling $200 to win $500 (current pot) + $200 opponent's turn bet + $300 from your opponent on the river. So, you are calling $200 to win a pot of $1200. You need a $200 / $1200 chance of winning the pot. $200 / $1200 = 16.6%.

Reverse Odds

First we have to figure out how often our opponent will hit his winning hand. He has a flush draw, so presumably he has 9 outs. Using the Rule of Two, we know that he has a 9x2 = 18% chance of making a flush on the river. So, you have an 82% chance of winning the pot and an 18% chance of losing the pot.

Next, we have to do some algebra.

$50 (pot size) + X (our bet) + X (his call) = 50 + 2X (total pot after our bet)

He will have had to call X to win a pot of 50 + 2X.

Therefore, his Break Even Percentage is:

$$\frac{X}{50 + 2x}$$

Now we can solve for X.

18% = X / (50 + 2X)

(18% * 50) + (18% * 2X) = X ←Multiply both sides by 50+2X

9 + 0.36X = X ← Simplify

9 = X – 0.36X ← Subtract 0.36X from both sides

9 = 0.64X ← Simplify

9/0.64 = X ← Divide each side by 0.64

14.06 = X

So, if you bet $14 on the turn, your opponent will be getting break even odds to call.

Bonus Question:

Expected Value of his call:

18% of the time, he'll win $150 ($50 in the pot plus your $100 bet)

82% of the time, he'll lose $100 (his call of your $100 bet)

18% * $150 = $27

82% * -100 = -$82

Expected Value = -$55.

By calling your all in, he is essentially giving you $55. Thanks very much.

Bluffing Expected Value

You sense some weakness from your opponent, but you missed your draw and can't win the pot without bluffing. There is $300 in the pot. You believe that a bluff of $200 will work about 30% of the time. Should you make the bluff?

Expected Value of Your Bluff

$300 (win the pot) * 30% = $90

+ -$200 (lose your bet) * 70% = -$140

= -$50

Bluffing on the river has an expectation of losing $50 over the long run. You should not make the bluff.