2 - Player Pineapple Odds/Outs Instructions

All outs are calculated from only knowing the cards up to current decision. First Street is the first player looking at their first 5 cards.
Blue represents the out of position - OOP - player, or Odd Streets.
Red represents the in position - IP or Button - player, or Even Streets.

Known Cards Example:
You are OOP and have just picked up 3 cards on your 4th draw (5-3-3-3), also known as **7th Street**. You can see your cards (9), your opponents board (9), your 3 draw cards (3), and you know your 2 dead cards (2).

- **Known Cards** = 9 + 9 + 3 + 2 = 23

Direct Outs Example:
Now with the 3 cards in your hand you may want to know the odds of hitting 5 outs on the last draw (3 left to draw), in order to determine where to place that devilish Queen (or some other tough decision).

- Scroll to the Direct Odds Table, **5 outs**, **7th Street**, and find **45%**

Indirect Outs/Runner-Runner Outs Example:
If you needed to hit **5-outs** then **4-outs**, and you were on **7th Street**:

- Scroll to the Indirect Outs Table, **5/4**,**7th Street** and see that you have **12%**.

How To Make Calculations
(Only for Math Nerds)

If I have X outs and there are Y cards in the deck, then my chances of drawing 1 card and it being one of my outs is: **X/Y**

Start by creating a table with all of our **numbers of outs** - X - across all different **deck sizes** - Y - for only 1 draw.

The odds of missing when drawing 1 card are the remainder of the odds of hitting, X/Y, which you can compute as either (1-X/Y) or (Y-X)/Y, (it's the exact same because Y-X = all the cards that don't hit your outs) either way its the "chance of missing our outs."

If we get two draws and want to know the odds of hitting our outs, we add:

- Chances of hitting the first draw: **X/Y**
- Chances of missing the first - **(1-X/Y) *** Chances of hitting the second - **X/(Y-1)** - where the 1 is the 1 card we took out of the deck on the first draw.

The complete equation is:
- **X/Y +(1-X/Y) * X/(Y-1)**

If we have more draws, we can chain the events together using the same process to get our result.

For Conditional Probability, we multiply the chances of hitting one draw by the chances of hitting another... and, of course, making sure we are using the appropriate number of outs and cards in the deck for each calculation.

Pineapple Open Face Chinese 2-Player Direct Outs/Odds From Current Street's Decision

Street	1st Street		2nd Street		3rd Street		4th Street		5th Street		6th Street		7th Street		8th Street	
	Known	To Draw	Known	To Draw	Known	To Draw	Known	To Draw	Known	To Draw	Known	To Draw	Known	To Draw	Known	To Draw
Outs	5	12	10	12	13	9	15	9	18	6	20	6	23	3	25	3
1	**26%**		**29%**		**23%**		**24%**		**18%**		**19%**		**10%**		**11%**	
2	**45%**		**49%**		**41%**		**43%**		**33%**		**34%**		**20%**		**21%**	
3	**60%**		**65%**		**56%**		**58%**		**45%**		**48%**		**29%**		**31%**	
4	**71%**		**76%**		**67%**		**69%**		**56%**		**58%**		**37%**		**39%**	
5	**79%**		**83%**		**75%**		**77%**		**65%**		**67%**		**45%**		**47%**	
6	**85%**		**89%**		**82%**		**84%**		**72%**		**75%**		**52%**		**55%**	
7	**89%**		**92%**		**87%**		**88%**		**78%**		**80%**		**58%**		**61%**	
8	**93%**		**95%**		**90%**		**92%**		**83%**		**85%**		**64%**		**67%**	
9	**95%**		**97%**		**93%**		**94%**		**87%**		**89%**		**69%**		**72%**	
10	**96%**		**98%**		**95%**		**96%**		**90%**		**92%**		**73%**		**77%**	
11	**98%**		**99%**		**97%**		**97%**		**92%**		**94%**		**78%**		**81%**	
12	**98%**		**99%**		**98%**		**98%**		**94%**		**96%**		**81%**		**84%**	
13	**99%**		**99.53%**		**99%**		**99%**		**96%**		**97%**		**85%**		**88%**	
14	**99%**		**99.72%**		**99%**		**99%**		**97%**		**98%**		**88%**		**90%**	
15	**99.57%**		**99.84%**		**99%**		**99.60%**		**98%**		**99%**		**90%**		**92%**	

Pineapple Open Face Chinese 2-Player Indirect Outs/Odds from Current Street's Decision

Street	1st Street		2nd Street		3rd Street		4th Street		5th Street		6th Street		7th Street		8th Street	
	Known	To Draw	Known	To Draw	Known	To Draw	Known	To Draw	Known	To Draw	Known	To Draw	Known	To Draw	Known	To Draw
Outs	5	12	10	12	13	9	15	9	18	6	20	6	23	3	25	3
1/1	**6%**		**8%**		**5%**		**5%**		**3%**		**3%**		**1%**		**1%**	
2/1	**11%**		**13%**		**9%**		**10%**		**5%**		**6%**		**1%**		**2%**	
2/2	**19%**		**23%**		**16%**		**17%**		**9%**		**11%**		**3%**		**3%**	
3/1	**15%**		**18%**		**12%**		**13%**		**7%**		**8%**		**2%**		**2%**	
3/2	**26%**		**31%**		**22%**		**24%**		**13%**		**15%**		**4%**		**5%**	
3/3	**34%**		**41%**		**29%**		**32%**		**19%**		**21%**		**6%**		**7%**	
4/1	**17%**		**21%**		**15%**		**16%**		**9%**		**10%**		**3%**		**3%**	
4/2	**31%**		**36%**		**26%**		**28%**		**16%**		**18%**		**5%**		**6%**	
4/3	**41%**		**48%**		**35%**		**38%**		**23%**		**26%**		**8%**		**9%**	
4/4	**49%**		**56%**		**43%**		**46%**		**29%**		**32%**		**11%**		**12%**	
5/1	**19%**		**23%**		**17%**		**18%**		**10%**		**11%**		**3%**		**4%**	
5/2	**34%**		**40%**		**30%**		**32%**		**19%**		**21%**		**7%**		**8%**	
5/3	**46%**		**53%**		**40%**		**43%**		**27%**		**30%**		**10%**		**11%**	
5/4	**55%**		**62%**		**49%**		**52%**		**34%**		**37%**		**13%**		**15%**	
5/5	**61%**		**69%**		**55%**		**59%**		**39%**		**43%**		**16%**		**18%**	
6/1	**21%**		**25%**		**18%**		**20%**		**12%**		**13%**		**4%**		**5%**	
6/2	**37%**		**43%**		**33%**		**35%**		**22%**		**24%**		**8%**		**9%**	
6/3	**50%**		**57%**		**44%**		**47%**		**30%**		**33%**		**12%**		**13%**	
6/4	**59%**		**66%**		**53%**		**57%**		**38%**		**41%**		**15%**		**17%**	
6/5	**66%**		**73%**		**60%**		**64%**		**44%**		**48%**		**18%**		**21%**	
6/6	**71%**		**78%**		**66%**		**69%**		**50%**		**53%**		**22%**		**25%**	

Pineapple Open Face Chinese 2-Player Indirect Outs/Odds from Current Street's Decision

Street	1st Street		2nd Street		3rd Street		4th Street		5th Street		6th Street		7th Street		8th Street	
	Known	To Draw	Known	To Draw	Known	To Draw	Known	To Draw	Known	To Draw	Known	To Draw	Known	To Draw	Known	To Draw
Outs	5	12	10	12	13	9	15	9	18	6	20	6	23	3	25	3
7/1	**22%**		**26%**		**19%**		**21%**		**13%**		**14%**		**5%**		**5%**	
7/2	**39%**		**45%**		**35%**		**37%**		**24%**		**26%**		**9%**		**10%**	
7/3	**52%**		**59%**		**47%**		**50%**		**33%**		**36%**		**13%**		**15%**	
7/4	**62%**		**69%**		**57%**		**60%**		**41%**		**45%**		**17%**		**20%**	
7/5	**70%**		**76%**		**64%**		**68%**		**48%**		**52%**		**21%**		**24%**	
7/6	**75%**		**82%**		**70%**		**73%**		**54%**		**58%**		**25%**		**28%**	
7/7	**79%**		**85%**		**74%**		**78%**		**59%**		**63%**		**28%**		**32%**	
8/1	**23%**		**27%**		**20%**		**22%**		**14%**		**15%**		**5%**		**6%**	
8/2	**41%**		**47%**		**37%**		**39%**		**26%**		**28%**		**10%**		**11%**	
8/3	**55%**		**61%**		**49%**		**52%**		**36%**		**39%**		**15%**		**17%**	
8/4	**65%**		**71%**		**59%**		**63%**		**44%**		**48%**		**19%**		**22%**	
8/5	**72%**		**79%**		**67%**		**70%**		**52%**		**55%**		**24%**		**27%**	
8/6	**78%**		**84%**		**73%**		**76%**		**58%**		**62%**		**28%**		**31%**	
8/7	**82%**		**88%**		**78%**		**81%**		**63%**		**67%**		**31%**		**35%**	
8/8	**85%**		**90%**		**81%**		**84%**		**67%**		**71%**		**35%**		**39%**	
9/1	**24%**		**27%**		**21%**		**23%**		**14%**		**16%**		**6%**		**6%**	
9/2	**42%**		**48%**		**38%**		**40%**		**27%**		**29%**		**11%**		**13%**	
9/3	**56%**		**62%**		**51%**		**54%**		**38%**		**41%**		**16%**		**18%**	
9/4	**67%**		**73%**		**61%**		**64%**		**47%**		**50%**		**21%**		**24%**	
9/5	**74%**		**80%**		**69%**		**73%**		**54%**		**58%**		**26%**		**29%**	
9/6	**80%**		**86%**		**76%**		**79%**		**61%**		**65%**		**30%**		**34%**	
9/7	**84%**		**89%**		**80%**		**83%**		**66%**		**70%**		**34%**		**39%**	
9/8	**87%**		**92%**		**84%**		**87%**		**71%**		**75%**		**38%**		**43%**	
9/9	**90%**		**94%**		**87%**		**89%**		**74%**		**78%**		**42%**		**47%**	