6/6/04 This is the fourth draft of the chapter on Outs in Hold'em Brain by King Yao. Please email feedback, suggestions, comments, opinions, questions to KingYao@HoldemBrain.com or you could use the Feedback Form to email me at the bottom of the page**.**

Hold'em Brain: Outs

In order to understand pot odds, you must know the expected pot size and the number of outs you have. Knowing how your opponent plays will help you determine the expected pot size and the number of expected outs you have. Without knowing each of these factors, you would not be able to figure out proper pot odds, and thus have a difficult time making the correct decision at the poker table. This section is on outs; how to identify them and how to count them. It is important that you develop a thorough understanding of outs before you read the next chapter on pot odds.

What is an out?
An out usually refers to a card that could come in a future round to improve a hand to the best hand. For the hand that is behind, the number of outs is the sum of all cards that can make the hand that is behind improve to the best hand. If you were behind in the previous round, and you receive an out on the next card, then you are now ahead. A non-out is the opposite of an out. A non-out is a card that will not turn your hand from a loser into a winner, instead, a non-out keeps your hand in the same relative rankings as the previous round. If you were behind in the previous round, and you receive a non-out on the next card, you are still behind.

For the purposes of this book, outs will be considered as all cards that help a hand, whether it means improving your hand or keeping your hand ahead of other hands. If you are behind, an out will improve your hand from a losing hand to a winning hand. If your hand was already ahead, an out will not hinder the hand. Non-outs will be considered all cards that are bad for your hand, whether your hand is ahead or behind. If you are behind and you receive a non-out on the next card, it means you did not improve relative to the other hands. Your hand could actually improve in ranking, but if the other hands improve at the same time, then you are still behind. In situations like that, the card would still be a non-out, not an out. The concept of outs and non-outs is helpful in that it helps you figure out the chances of winning a hand. When you know the expected pot size, how our opponents play, and the number of outs you have, then you would have enough information to make a proper decision.

Here is an example of the concept of outs. You have four cards to the nut flush on the Turn. You have two suited cards in your hand and there are two cards of the same suit on the board.

Your hand: A♠K♠

Board: Q♠7♠3♣2♦

If you make your flush, it would be the nut hand provided someone does not have a full house (there are no straight flush possibilities since the gap between the Q♠ and the 7♠ is too wide). In this case, the 9 remaining spades would give you the nut flush, but not necessarily the nut hand. Out of the 9 flush cards, 7 of them will not pair the board (thus giving you the nut hand). Two of

the flush cards will pair the board (3♠ and 2♠). For the 7 flush cards that do not pair the board, you know those cards are definitely outs as it makes your hand the nut flush because there are no possibilities of a full house or four-of-a-kind. If the flush card that comes on the River does pair the board, you may be in a dangerous position if any player held three-of-a-kind or two pair going in, because that player could then make a full house or four-of-a-kind when you make your flush.

In this example, you know 6 cards before the River card is dealt, 2 cards in your hand and 4 on the board. Since there are 52 cards in a deck, this means you do not know the other 46 cards. If you did have 9 outs that means the other 37 (46-9 = 37) cards in the deck would be non-outs.

The concept of the number of unknown cards may be confusing since there are actually less than 46 cards left in the dealer's hand after the Turn. If he has dealt in 10 players, it means he has dealt 20 cards to the players. With 4 cards on the board after the Turn, this would mean the dealer would only have 28 cards left in the deck in his hand (actually 26 since he has burned two cards, one before the Flop and one before the Turn). However since we do not know what the other players' holdings are, it is usually correct to assume 46 unknown cards after the Turn. For any particular card, there is a chance it was dealt to another player or still left in the deck. Since we do not know which cards were dealt to the players or are still in the deck, we cannot make any assumptions about what is left in the deck. Sometimes we can be quite sure of an opponent's two hole cards based on the play of the hand thus far, in these cases, we can be sure there are only 44 unknown cards. But these are rare cases, it is usually correct to assume 47 unknown cards after the Flop and 46 unknown cards after the Turn.

Counting Outs

The process of counting outs is a combination of art and science. If we knew exactly what our opponent's cards are, then it would be a science, as we would be able to calculate our outs and non-outs. But poker is a game of imperfect information. It is an unusual circumstance when we know the exact two cards our opponent holds but we can often have a good idea of what the other players may hold based on their play so far. A player who has the ability to read the hands of his opponents with precision will be able to pinpoint his opponents' cards with a greater degree of accuracy than those players who cannot read hands well. But even for the great hand readers, there is usually a level of uncertainty.

Here are some guidelines to counting outs

1. Try to get a general idea of the cards that your opponents hold. This can be done by observing your opponents' playing styles as well as their actions up to the particular point in the hand.

2. If you are ahead, it is not necessarily to count your outs in a Limit Hold'em game. This is because if you are ahead and your opponent needs to improve, you will definitely have enough pot odds to stay in the hand. It is only when you are behind and need to improve that you need to know the chances of bettering your hand to one that outranks his. However, there are times when you are not sure if you are ahead or behind. In those cases, you will need to know how many outs you have if you are behind and how many outs you have if you are ahead and have a way to estimate the chances you are ahead or behind.

3. If you are behind, then you need to have an idea of which cards can improve your hand to one that is better than your opponents.

4. Once you have identified the exact cards that can improve your hand, you need to count them. For example, if you have a flush draw and you know it is a winner if you catch it, then you have to find out how many cards are left that are of the same suit as your flush draw. If you have a flush draw, it means you have four cards of the same suit, either two in your hand and two on the board or one in your hand and three on the board. Since there are thirteen cards of the same suit in a deck, there would be nine cards left that are of the suit that you need.

5. Once you have an idea of how many outs you have, you will need to know how many non-outs you have. The non-outs will simply be the number of unknown cards minus the number of outs. Since you can usually assume there are 47 unknown cards on the Flop and 46 unknown cards on the Turn, you can just subtract the number of outs from the number of unknown cards on the appropriate round to figure out how many non-outs there are.

Round	Unknown cards
Flop	47
Turn	46

Examples of Outs, Unknown Cards and Non-Outs

Round	Outs	Unknown Cards	Non-Outs
Flop	9	47	38
Flop	6	47	41
Turn	8	46	38
Turn	3	46	43

Before the Flop

With starting hands there are normally too many possibilities and too little information to tell exactly how many outs you may have to make a winning hand. There are some hands that make it relatively easy to figure out, such as when you have a small pocket pair against many other players. In that case, players will usually think they have 2 outs to hit on the Flop, because they will not be willing to continue with the hand unless they Flop a set (a three-of-a-kind). But even with a small pocket pair, there is more than one way to win. If the board comes with three straight cards and your pair is smack in the middle of it, such as when you hold 55 and the Flop is 6-4-3, you have a playable hand to see if a 7 or 2 comes later to make a straight. Also if the board contains a small pair with another low card, such as when you hold 55 and the Flop is 4-4-2, you

may have a playable hand unless you really think someone else has a bigger pair or a 4.

After the Flop
Once the Flop comes, you will have a better idea of how many outs you have, but you still will not know with too much certainty until you get more information about the other players' hands. For example:

Your hand: ATo

Flop: T-7-4 rainbow

In this situation, you know that you are ahead unless someone has a set, two pair or a big pocket pair. Here is a table on the number of outs and non-outs that AT has against other hands with a board of T-7-4.

Your hand is AT with a board of T-7-4

Opponent's Hand	Your Outs	Your Non-Outs
KT	42	3
QJ	39	6
87	40	5
98	37	8

Although normally the assumption is 47 unknown cards on the Flop, the tables above reflect 45 unknown cards. This is because we are comparing two hands, thus we actually know 7 cards (3 cards on the board and 2 separate cards in each of the two player's hands), which means there are 45 unknown cards left in a 52 card deck.

Taking a look at the first opponent's hand of KT, he must hit a K in order to beat your AT. If he does not improve to K's and T's, he cannot beat your AT since you will have a higher kicker, remember, the best 5 cards play in Hold'em. Since there are only 3 K's left in the deck, he would only have 3 outs, and those outs for him would be non-outs for you. The remaining 42 cards are non-outs for him and outs for you.

If you think you are ahead, it is not as necessary to know your outs. When you find other players playing aggressively, it may be a hint that you are not ahead. In the above example, an opponent could have an overpair with AA, KK, QQ, or JJ, in which case, you could have as many as 5 outs (when he has KK, QQ or JJ) or as few as 2 outs (when he has AA).

On the Flop, unless you are drawing to the ultimate nut hand, it is possible to catch your out on the Turn only to be redrawn and have your opponent catch his out on the River. In such a case, when you are behind on the Flop, you may actually have fewer effective outs than you think because you

can catch on the Turn and still lose on the River. In general, is usually a good idea to be conservative about the number of outs you have.

After the Turn card
When there is only one card left to come, and you can read the opponents well, it becomes much easier to figure out how many outs you have. If you have a hard time reading your opponent's hand, then it makes it tougher to know your outs. At this point, you would not need to be concerned with getting redrawn if you catch your out, since there is only one card left to come. All you would need to be concerned about is how many outs and non-outs you actually have. This is easier said than done. It will take experience and studying the game to become skilled in this area.

After the River card
Once all the cards are out, no player has any outs left. There is no need to count outs at this point. The only decision is to approximate your chances of having the winning hand and understanding the pot size.

Drawing dead
A player that is drawing dead refers to a hand that is behind and has zero chance of becoming a winner by the River, a hand that has no outs. For example

Player 1: Q♠9♠

Player 2: A♣A♥

Board: A♠A♦K♠K♦

Player 1 cannot improve his hand to a hand better than four-of-a-kind, which is what the Player 2 has. Player 1 is drawing dead as there are no cards that can come on the River to make him a winner. A more common occurrence happens when a player has overcards to the board on the Turn, while another player already has two pair. In that case the best the River card can do for the player with overcards is to improve his no-pair hand to one pair, which still will not beat two pair. For example:

Player 1: AKo

Player 2: 87o

Board: T-8-7-3 rainbow

Player 1 is drawing dead, there are no cards that can come on the River to give him a winning hand over Player 2. The only way Player 1 can win this hand is if Player 2 folds to a bluff bet or raise by Player 1.

Drawing thin
Drawing thin refers to the situation when there are very few cards that are outs. The number of

outs may only be 1 or 2. For exmmple:

Player 1: Q♣J♣

Player 2: A♠A♥

Board: A♣A♦K♣K♦

In this situation, Player 1 can make a royal flush, which would be better than Player 2's four A's. There is only one card that can give Player 1 a royal flush, that card is the T♣. So Player 1 is drawing to only 1 out, and that means he is drawing thin.

Great Draw
Sometimes you can have a hand that is a favorite to win but is not leading at the moment. For example:

Player 1: Q♥J♥

Player 2: 2♣2♦

Board: K♥T♠T♥3♣

Player 1 has 25 outs and only 19 non-outs even though Player 2 has a pair already while Player 1 does not. The pair of 2's that Player 2 holds is the better hand at the moment, but Player 1 is actually favored to win this match-up. Specifically, any Q or J gives Player 1 a better two pair (6 outs), any K or 3 will give Player 1 a better two pair with a higher kicker (6 outs), any heart will give Player 1 a flush (7 outs, the 2h is not an out since it gives your opponent a full house and we have already counted the 3h), and any A or 9 that is not a heart will give Player 1 a straight (6 outs). In practice, it will be difficult to know when you are in such a great situation like this. If you held Player 1's card, you cannot be sure your opponent has 2♣ 2♦, but you should know that unless he has a full house or a chance to hit a full house when you hit one of your draws, that you have a nice chance of winning this hand.

When your outs are not actually outs, and when a blank is actually an out
In Hold'em, the situation will come up often when a card that improves your hand will also improve an opponent's hand. In such a case, you may think the card is an out for you when it may not be at all. For example:

Your hand: A♠K♣

Board: Q♣8♦7♠2♥

If your opponent has a pair, then it is possible that you have 6 outs, as any A or K could turn your hand from a loser to a winner. But if your opponent holds a card that matches the board and one of your hole cards (in this case, an A or K), then you actually only have 3 outs. For example, in the above hand, if he had A♣2♦, then your only outs are the three other K's in the deck. Although any

A will improve your hand to a pair of A's, it improves his hand from a pair of 2's to two pair.

Another frequent occurrence is when a card that gives you a pair actually gives the other player a straight. In a case like that, it may be that a card that you thought was an out for you is actually an out for him, and he was the one chasing. For example:

Your hand: A♣9♦

Board: K♣T♠2♦2♥

If your opponent holds Q♣ J♠, then an A is actually an out for him, not for you, as it gives him a straight. You are actually ahead on the Turn and more cards can come on the River to give you the winning hand, but from the play of the hand, it may not necessarily look like that.

Assume we have perfect information

Assume we have perfect information and we know our opponent's cards. This will make it easier to figure out how many outs we have. It is also easiest to use the situation on the Turn as there will be only one more card to come on the River. This means we will not be worried about catching our hand only to get redrawn at a later round as might be the case on the Flop when there are still two cards to come. We also do not need to worry about what happens if we miss on the Turn and catch on the River.

Here are some hands, the boards, the specific cards that are outs and the number of outs and non-outs for your hand.

Your hand	Opp.'s hand	Board	Cards that are outs for your hand	Number of Outs	Number of Non-Outs
J♥T♥	K♣K♦	K♥8♠6♥4♠	A♥, Q♥, 9♥, 8♥, 7♥, 5♥, 4♥, 3♥, 2♥	9	35
J♥ T♥	K♣K♦	K♥Q♠7♣3♦	A♣, A♦, A♥, A♠, 9♣, 9♦, 9♥, 9♠	8	36
A♣A♦	K♠Q♠	K♣Q♣J♠7♠	A♥, J♣, J♦, J♥, T♣, T♦, T♥, 7♣, 7♦, 7♥	10	34
9♠8♠	J♠J♣	A♣9♣7♦6♦	T♣, T♦, T♥, T♠, 9♦, 9♥, 8♣, 8♦, 8♥, 5♣, 5♦, 5♥, 5♠	13	31
A♣K♦	Q♣Q♦	J♣8♦3♠2♥	A♦, A♥, A♠, K♣, K♥, K♠	6	38
T♠9♠	A♠K♠	Q♠J♠T♣9♣	8♠, T♥, T♦, 9♥, 9♦	5	39

Note that the total number of unknown cards for each hand in this table is 44. Normally the

assumption is 46 for the number of unknown cards on the Turn, but in this table, the assumption is that the opponent's hand is known, so that cuts down 46 unknown cards to 44 unknown cards.

As a general rule of thumb, if you think your hand becomes the best hand if you hit your draw, you can assume the following number of outs:

Type of Draw	Rule of thumb for outs with 1 card to come
Flush draw	9
Open ended or double inside straight draw	8
Overpair versus two pair	6
Two overcards versus one pair	6
Middle pair versus Top pair where the kickers are different	5
Inside straight draw	4
One overcard versus one pair	3
Pocket pair versus a higher pair	2

Sometimes we have a combination of more than one of these type of draws. We could have a flush draw and a straight draw at the same time, which could increase the number of outs up to 15. For example:

Your hand: J♣T♣

Board: Q♣-9♣-x-x

In this case, any club would make you a flush and any K or 8 would make you a straight. There are 9 clubs left in the deck, and 8 straight cards left in the deck (4 K's and 4 8's). However, the K♣ and the 8♣ are already counted as one of the 9 clubs, so there really is only 6 other cards that would give your hand a straight. In total 15 cards would make either the straight or flush.

Counting the outs for a straight draw and a flush draw

Counting the outs when you have a nut straight draw or a nut flush draw (the best possible straight and flush that can be made, thus giving you the best hand possible if you hit your draw) is straightforward.

With an open-ended straight draw, there are 8 outs, since you will have two different rank of hands to make your straight and each rank has 4 cards. For example, if you hold JT, and the board shows Q9, any K or 8 will give you the straight. Since there are 4 cards of each rank, that means there are 8 cards that are left in the deck that would give you the straight, thus 8 outs. With an inside straight

draw, there are only 4 outs, as there is only one rank that can make your hand. A flush draw when you have four cards to a flush has 9 outs. There are 13 cards of the same suit in the deck, and if you have 4 of them, that means there are 9 cards of the same suit left. As an example, lets say you have two hearts.

Your hand: A♥3♥

Board: T♥9♠8♠2♥

From the betting thus far and the composition of the players, you are sure that someone else already has a straight, so you must hit your flush draw in order to win the hand. Any heart will give you the flush, and since you have the A♥, it will give you the nut flush. There is a total of 13 hearts in a deck, you have 2 in your hand and there is 2 on the board, that means there are 9 hearts left in the rest of the deck. There is a total of 46 cards left in the deck. There is a total of 52 cards in a deck, and you know 6 of them, 2 in your hand and 4 on the board, so that leaves 46 cards you have not seen. With 46 cards left in the deck and 9 cards that are outs, that means the remaining 37 cards are non-outs. (The 9 and the 37 are the crucial numbers for the method we are going to use when we compare the number of outs we have versus the expected pot size.)

Counting the outs when you have overcards to the board
If you have two overcards to the board, pairing either of them may be an out for your hand. For example:

Your hand: AKo

Your opponent's hand: QJo

Board: J-8-3-2 rainbow

With this setup, you would have 6 outs. There are three A's and three K's left in the deck, and if any of them come on the River, your hand will be best. Sometimes the opponent will have one of your outs counterfeited, where if you hit that card, it would improve his hand as well. For example, if the opponent's hand is changed from QJ to AJ, the remaining two A's (there are only two A's left now because he has one and you have one) are no longer outs for your AK hand. The only outs left are the three K's.

In the heat of the battle at the poker table, we do not have perfect information and we do not know our opponent's exact hand. It is possible we are actually ahead and the opponent has a hand like T9, going for a straight draw. If we know the opponent well, his actions will give us a good idea of his holdings. Say we know he would not raise with only a straight draw, but would raise with the top pair and a good kicker. In that case, he could have a hand like AJ, KJ or QJ. If he has QJ, then the AK hand has 6 outs. If he has either AJ or KJ, then the AK hand has only 3 outs. At the table, we could estimate the expected number of outs to be 5 in that case.

Counting the outs when you have a split pair versus an opponent's higher split pair
A split pair means when you make a pair with one card in your hand and one card on the board.

For example:

Your hand: ATo

Flop: J-T-3 rainbow

In this case, you have a split pair of T's, one in your hand and the other on the board. If you suspect your opponent has a split pair of J's, then you may think you have 5 outs (three A's and two T's). However, if your opponent's kicker matches your kicker, then you would only have 2 outs (two T's). For example, if he had JT, he would already have two pair, and you would have 3 outs (three A's). But if he had AJ with only one pair, and you hit your A for two pair, then he would simultaneously hit his two pair as well, and his two pair would be better than your two pair since he would have A's and J's while you have A's and T's. In this case, you would only have the two remaining T's as outs. This may seem counterintuitive at first because in this situation, you would actually prefer he had JT for two pair than AJ for one pair. You prefer your opponent to have what would appear to be a stronger hand because you would actually have a better chance of drawing out against his two pair of J's and T's than you do of drawing out against his one pair with the same kicker as yours. When you improve by hitting an A, you are counterfeited because your improvement is fake.

Counting the outs when you may have more outs than you think
This can occur if you are on a straight draw or a flush draw, but have another chance of winning, such as pairing one of your cards. If you are not sure, it would be helpful to estimate the probability one of these overcards as an out. For example:

Your hand: A♠T♠

Board: K♠9♠7♣2♥

If you do not think your opponent has a draw to a full house, then you have 9 outs for the flush. If your opponent only has a pair and does not have an A or T as his kicker, then you may have up to 6 additional outs. If he has KQ, then any A is an out for you, giving you 3 additional outs with your flush draw, although the a T would not be an out for your hand. If he has AK, then an A is not an out for you, and you only have 9 outs. If he has 98 for a pair of 9's, then both the A and the T would be outs for you, giving you 6 additional outs with your flush draw for a total of 15 outs. As a rule of thumb, normally assume half of the overcard(s) that you may have to the board are outs because pairing your overcard may or may not give you the winning hand. In the case above, with A♠T♠ as your hand, assume there are 1.5 additional outs along with the flush draw. This is because only an A is a true overcard to the board. So consider yourself to have 10.5 outs, 9 outs for the flushes and 1.5 outs for the A, which is half of the three remaining A's. This is a shot in the dark method, but it is better than assuming 3 A's are outs as well as assuming none of them are outs. Of course, the betting of the hand in particular may tell you otherwise. If the betting has been strong from decent players from the beginning, it makes it more likely someone has AA or AK, in which case there are no additional outs to the flush draw outs. Also, the number of players will make a difference. With more players, the likelihood of any overcard being an out decreases. If

one opponent has KQ, another opponent could have A9, in which case neither the A nor the T would be additional outs.

Counting the outs when there is a chance you are drawing dead
There are times when you are not sure if you are drawing dead or drawing live. For example:

Your hand: Q♣J♠

Flop: K♥T♣T♦

It may look like you likely have 8 outs since there are 8 cards that can make your straight. But if your opponent already has a full house or four-of-a-kind, then you are drawing dead. It will be rare when your opponent has two perfect cards for a full house or better, but it can happen. Even if he does not currently have it, you could make your straight on the Turn only to see him draw a full house on the River to beat you. In a case like this, it would be best to assume you have fewer outs since you may be drawing dead and if not could get redrawn. In an example like the one above, I would tend to subtract one out from the 8 outs for a straight, and assume 7 outs.

Counting the outs when there is a chance you are actually ahead
Sometimes you will have a hand that you are not sure is currently ahead or behind. If you are behind, you may still have a chance to improve. For example:

Your hand: J♠T♣

Board: Q♠J♣9♥3♦

If you are behind and your opponent has a Q, you could have as many as 13 outs (8 outs for the straight, 2 J's and 3 T's would make two pair). But you may actually be ahead if your opponent has T9, in which case you only have 2 non-outs to lose (2 9's), and 8 non-outs to push the hand when you both make a straight. There is also a chance your opponent already has a straight with KT, in which case you only have 3 outs to push the hand. These situations make it difficult to know exactly how many outs and non-outs you have. Being able to read your opponents well will certainly make the estimations of the number of outs you have a lot easier, as you will be able to pinpoint his hand with more accuracy.

When you have a pocket overpair, a pair on the board may decrease your opponent's outs
Assume you have an overpair in your hand to the board and you think your opponent has one pair with a distinct kicker from your hand. He would then have 5 outs. For example:

Your hand: AA

Your opponent's hand: JT

Flop: T-6-3 rainbow.

Your opponent's outs are 3 J's and 2 T's, for a total of 5 outs. However if the Turn pairs the board

with a card that your opponent does not have, then that reduces his outs to only two, the 2 T's. In the above example, if the Turn is a 6, and then the River is a J, then the board is:

Board: T-6-3-6-J

Your opponent will have two pair of J's and T's with his JT (he has three pairs with the pair of 6's on the board, but there is no such poker hand). You have two pair as well, A's and 6's, and your two pair would be a better two pair. In real play, it may be difficult to tell if your opponent had his outs reduced or if he caught three-of-a-kind with a 6. This is where reading your opponent's hand becomes helpful. Most players are more likely to play a hand that contains a T than a 6, so your opponents would usually be a major underdog to have caught trip 6's, but it is still possible.

Counting outs on the Flop: Runner-runner straights and flushes
A runner-runner straight draw or flush draw can occur if you have three to a flush or straight on the Flop, and catch two perfect cards on the Turn and the River to turn your hand into a flush or straight. For example:

Your hand: A♠3♠

Flop: A♣9♠8♣

You have three cards to a spade flush. If the suit of both cards on the Turn and the River are spades, then you will have hit a runner-runner flush. Hitting a runner-runner draw does not happen often but it should not be completely discounted when counting outs. If you assume the runner-runner flush draw is the best hand, you can figure out the probability of it occurring, then convert it into its equivalent in terms of outs.

One way to look at it is to say that 10/47 of the time, a fourth flush card will come on the Turn, thus giving you 9 flush outs on the River. The other 37/47 of the time, a fourth flush card will not come on the Turn, and you will have no flush outs on the River. So you can say that 10/47 x 9 is the expected value of the number of flush outs that you will have on the River.

Action	Computation	Result
EV of the number flush outs on the River	10/47 x 9 outs	1.91 outs going into the Turn

Another way to look at it is to compute the probability of hitting a runner-runner flush draw, and then multiplying that by the number of unknown cards to get the number of outs. Here is a table that shows the results. Notice that the answers are the same.

Action	Computation	Result
The probability of hitting a runner-runner flush draw	10/47 x 9/46	4.16%

Converting 4.16% into the equivalent of outs	4.16% x 46	1.91 outs

As a rule of thumb, I would count the number of outs for runner-runner flush draws depending on how high the runner-runner flush draw is. This is because there is a chance that a player may catch the runner-runner flush draw but still may not have the best hand if someone else had a higher flush draw at the same time.

Here is a table of estimated outs to use for runner-runner flush draws

How high is the flush draw?	Estimated Number of Outs
Ace-high	2
King/Queen high	1.5
All others	1

For runner-runner straight draws, there are a much wider variety of ways to catch them.

1. When you need one perfect card, then one of two cards

Your hand: JT
Flop: K-T-3

In this case, you need to catch a Q on the Turn, then either a A or a 9 on the River. You could also first catch the A or 9 on the Turn and then catch the Q on the River. In either case, you need to have the Q to make your straight.

The probability of hitting a runner-runner straight draw with one perfect card needed:

Action	Computation	Result
The probability of hitting a runner-runner straight draw with one perfect card needed	(4/47 x 8/46) + (8/47 x 4/46)	2.96%
Converting 2.96% into the equivalent of outs	2.96% x 47	1.39 outs

In a hand like this, if you believe your opponent has a hand like AK, you would consider 3 J's and 2 T's as outs. With the runner-runner straight draw possibility, you can add another 1 out for a total of 6 outs. I adjust 1.39 outs and turn it into only 1 out because of the chance you can hit your hand on the Turn, but your opponent draws an even higher hand on the River.

2. When you need two cards, but you have more options

Your hand: T9
Flop: J-T-6 rainbow

In this case, you can make a runner-runner straight with any of these card combinations on the Turn and then River: KQ, QK, Q8, 8Q, 87, 78. Each of these combinations has a 0.74% chance of happening or 4/47 x 4/46. Since there are 6 combinations, then the total chance of hitting the runner-runner straight is 6 x 0.74% = 4.44%. The equivalent in terms of outs is 2.09. Here is the table.

Action	Computation	Result
The probability of hitting a runner-runner straight draw when there are more ways	4/47 x 4/46 x 6	4.44%
Converting 4.44% into the equivalent of outs	4.44% x 47	2.09 outs

But these combinations are dangerous too, in that you when you catch, someone else may have a higher straight. For example, using the above hole cards and Flop, if you catch a K on the Turn and a Q on the River, you would make a K-Q-J-T-9 straight. But a player with just an A would have a higher straight. So as a rule of thumb, count these runner-runner straight possibilities as only one out instead of two. It may be a bit on the conservative side, but it makes it easier to count outs on all runner-runner straight draws the same. There are already a lot of things to consider when playing a poker hand at the table. This tiny difference is small enough to ignore. In summary, count all runner-runner straight draws as 1 out.

KQ with a Flop of J-8-3 may be better than AK
Since many players like to play hands that contain an A,

If you have AK and do not hit a pair on the Flop, you may actually have fewer outs than compared to the times when you have two overcards without an A, such as with a hand like KQ. This is because you are more likely to get counterfeited with an A since so many players like to play hands that contain an A. Let's take a look at a specific situation.

Flop: J-8-3 rainbow

It is more likely for players to play hands like AJ or KJ than they would with QJ. It is more likely for them to have A8 than Q8 since A8 is perceived to be a better hand. So if your opponent has made a split pair on the Flop, you could still have 6 outs with KQ, but it will be less likely you have 6 outs with AK since hitting a A will more likely improve your opponent's hand as well, thus counterfeiting your hand.

Counting Outs Quiz
1. You are last to act on the Turn.

Your hand: 3♠2♠
Board: A♠5♣K♦ [turn] 9♥

There are three other players in the hand on the Turn. How many outs do you think you have?

Answer
With three other players, it is almost impossible for a 3 or a 2 to be an out for you, as you should be confident someone else has a pair if not better. You should count this as hand as having four outs, the four 4's will give you the nut straight and there will not be a flush possible.

2. You have checked and your opponent has bet on the Turn.

Your hand: Q♠8♣
Board: J♣T♦3♠ [turn] 4♣

You suspect your opponent has a J but you are not sure of his kicker. How man outs would you estimate?

Answer
You can make a straight with a 9, that would be four outs. If he does not have QJ, then 3 Q's become outs for you, but there is a chance he does have a Q, and it would be conservative to assume 2/3 of the time a Q will be an out. In that case, you can count it as two outs instead of three. When added to the four outs for the straight, it means you have a total of six outs.

3. You are in the big blind. There is only one limper, the small blind calls and you check.

Your hand: T♣3♣
Flop: J♣6♦2♠

Everyone checks on the Flop.

Turn: 4♣

The Turn gives you a flush draw and an inside straight draw. The small blind bets out and you are sure it means he is not bluffing because you know how he plays. You are sure he has at least a pair of J's. How many outs would you estimate you have?

Answer
You have 9 clubs to make the flush and 3 other 5's to make the straight (one of the 5 is a club, which was already counted as one of the 9 clubs). It looks like you have 12 outs. In the Pot Odds chapter, it will be shown how to use this information, along with the information on the expected pot size in order to make a decision on calling or folding.