

CHEAT SHEET • HULL CH 12

Option strategies, and why they matter

What combining options does that a share cannot, who uses it, and sixteen strategies with their profit at expiry, best and worst case, and break-evens.

A share or a futures contract gives you one bet: **up or down**. Combining options lets you bet separately on **direction**, on **how big the move will be** (volatility) and on **when** it happens (time), and pay for the exposure you want by selling one you do not. Every strategy here is built from four parts: the share, calls, puts and a bond.

Four jobs.

- **Take a precise bet.** “Up, but not past 120” is a bull spread; “a big move, either way” is a straddle; “nothing happens before next month” is a calendar spread. You pay only for the scenario you believe in.
- **Hedge a specific risk.** A put puts a floor under a share; a collar protects a large position for little or no cash by giving up some upside. Companies use the same shapes on fuel, currencies and rates.
- **Generate income.** Selling an option collects a premium for a risk someone else wants to shed. Index options have on average priced in more volatility than followed: the **volatility risk premium**.
- **Build products.** A principal-protected note, a buffer ETF or an option-income fund is a strategy from this sheet in a wrapper. Knowing the pieces tells you what you are buying and what it costs.

Where you will see them.

WHO, AND WHAT THEY DO WITH OPTIONS	REAL EXAMPLE
Hedge funds and trading desks. Bet on volatility, not direction (straddles into earnings); arbitrage mispricings (box and butterfly bounds); buy crash insurance (deep out-of-the-money puts).	Universa, a tail-risk fund, told clients its hedging strategy returned 3,612% in March 2020, measured on the capital it required, as the S&P 500 fell (client letter, reported by <i>The Wall Street Journal</i> , April 2020). A small hedge can offset a large loss.
Individual investors and families. Covered calls on shares they own; protective puts and collars on a large position; structured notes from a bank or adviser.	Mark Cuban says he collared the Yahoo shares he got for Broadcast.com in 1999 (bought puts, sold calls), protecting him through the dot-com crash (<i>Earn Your Leisure</i> podcast, via 24/7 Wall St., May 2026). U.S. listed options volume set a record 15.2 billion contracts in 2025 (OCC, January 5, 2026).
Asset managers. Harvest the volatility risk premium by selling calls or puts; package collars and put spreads into buffer ETFs that cap both loss and gain.	From 1990 to 2018 the VIX averaged 19.3% against 15.1% realized S&P 500 volatility (O. Bondarenko, <i>Historical Performance of Put-Writing Strategies</i> , Cboe, 2019). JPMorgan’s option-income ETFs JEPI and JEPQ held about \$45 billion and \$42 billion in mid-2026 (ETF Central); buffer ETFs held \$78 billion at the end of 2025 (Morningstar).
Corporate treasury. Cap input costs and currency or rate exposure with calls, collars and spreads: the same shapes, with a business on one side.	Southwest Airlines hedged jet fuel with options for decades, then ended the program in 2025, citing the rising cost of hedge premiums (Southwest Form 10-K, 2025). Hedging is insurance, and insurance has a price.

Three things to keep in mind.

- **No free lunch.** Every cap, floor or discount is paid for by giving something up. Find what was sold.
- **Bought options can expire worthless; sold options can lose far more than the premium.** Size for the bad case.
- **Every strategy can be reversed.** Sell what was bought, buy what was sold: the diagram flips.

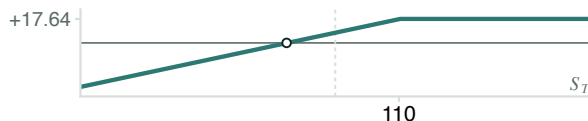
Reading the sheet. Diagrams show **profit at expiry**: payoff minus the net premium paid today, ignoring interest on the premium. Grey is zero, dotted is today's price, circles are break-evens; finite extremes are labeled on the left. **Cost** is net premium paid; a negative cost is a credit received.

Example prices (illustrative, not quotes): Black-Scholes, $S_0 = 100$, one year, 25% volatility, $r = 4\%$ continuously compounded, no dividend. Parity holds to the cent. Three-month 100 call: 5.47.

STRIKE	80	90	100	110	120
Call	24.78	17.55	11.84	7.64	4.74
Put	1.64	4.02	7.92	13.32	20.03

Covered call

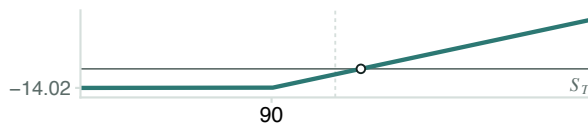
Build: own the share, sell a call at K ; e.g. the 110 call at 7.64. **View:** flat to modestly up; you sell the upside for cash now. Same shape as a short put.



Max profit $K - S_0 + c = 17.64$ · **Max loss** $S_0 - c = 92.36$ · **Break-even** $S_0 - c = 92.36$

Protective put

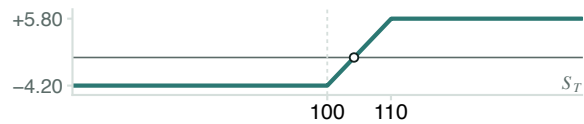
Build: own the share, buy a put at K ; e.g. the 90 put at 4.02. **View:** bullish, but you want a floor; the premium is the deductible. Same shape as a long call.



Max profit unlimited · **Max loss** $S_0 - K + p = 14.02$ · **Break-even** $S_0 + p = 104.02$

Bull call spread

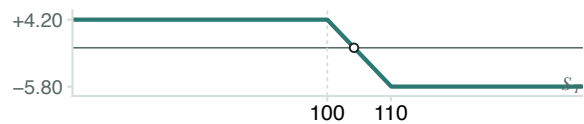
Build: buy a call at K_1 , sell one at K_2 ; e.g. 100/110, cost 4.20. **View:** up, not past K_2 ; the short call pays for part of the long. Squeeze the strikes and it becomes a digital (binary) bet.



Max profit $K_2 - K_1 - \text{cost} = 5.80$ · **Max loss** $\text{cost} = 4.20$ · **Break-even** $K_1 + \text{cost} = 104.20$

Bear call spread

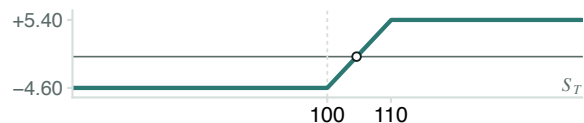
Build: sell a call at K_1 , buy one at K_2 ; e.g. sell 100, buy 110, a 4.20 credit. **View:** the stock stays below K_1 . The bull call spread, flipped.



Max profit $\text{credit} = 4.20$ · **Max loss** $K_2 - K_1 - \text{credit} = 5.80$ · **Break-even** $K_1 + \text{credit} = 104.20$

Bull put spread

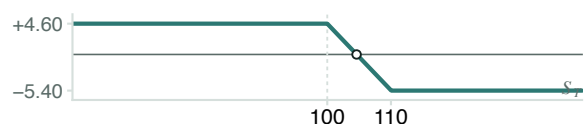
Build: sell a put at K_2 , buy one at K_1 ; e.g. sell 110, buy 100, a 5.40 credit. **View:** the stock holds above K_2 : the bull call view, paid up front. Break-even 0.40 higher, roughly the interest on $K_2 - K_1$.



Max profit $\text{credit} = 5.40$ · **Max loss** $K_2 - K_1 - \text{credit} = 4.60$ · **Break-even** $K_2 - \text{credit} = 104.60$

Bear put spread

Build: buy a put at K_2 , sell one at K_1 ; e.g. buy 110, sell 100, cost 5.40. **View:** a cheaper bearish bet: you pay only for the fall to K_1 , not to zero.



Max profit $K_2 - K_1 - \text{cost} = 4.60$ · **Max loss** $\text{cost} = 5.40$ · **Break-even** $K_2 - \text{cost} = 104.60$

Box spread

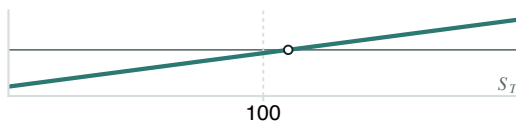
Build: bull call spread plus bear put spread, same strikes; e.g. 100/110, cost $4.20 + 5.40 = 9.60$. **View:** none. It pays $K_2 - K_1$ always (diagram shows payoff): a zero-coupon bond. Buy it to lend, sell it to borrow.



Fair value $(K_2 - K_1)e^{-rT} = 9.61$ (9.60 is rounding); any other price is an arbitrage before costs. Early assignment makes an American box only roughly a bond.

Synthetic forward

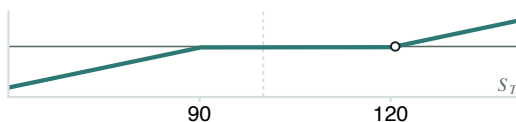
Build: buy a call, sell a put, same K ; e.g. 100, cost 3.92. **View:** own the share at expiry. Parity says the cost is $c - p = S_0 - Ke^{-rT} = 100(1 - e^{-0.04}) = 3.92$.



Max profit unlimited · **Max loss** 103.92 · **Break-even** 103.92; add interest on the 3.92 and you reach the forward price, $100e^{0.04} = 104.08$.

Risk reversal

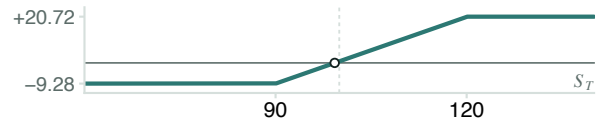
Build: buy an out-of-the-money call, sell an out-of-the-money put; e.g. 120 call, 90 put, cost 0.72. **View:** directional at near-zero cost: long upside, short downside, flat between.



Max profit unlimited · **Max loss** $K_1 + \text{cost} = 90.72$ · **Break-even** $K_2 + \text{cost} = 120.72$

Collar

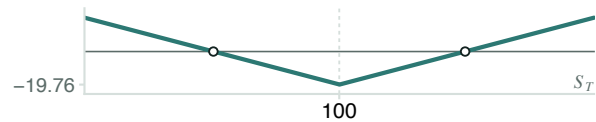
Build: own the share, buy a put at K_1 , sell a call at K_2 ; e.g. 90 put, 120 call, a 0.72 credit. **View:** cheap protection for a big holding: the share plus a short risk reversal (Mark Cuban's trade).



Max profit $K_2 - S_0 - \text{cost} = 20.72$ · **Max loss** $S_0 - K_1 + \text{cost} = 9.28$ · **Break-even** $S_0 + \text{cost} = 99.28$

Straddle

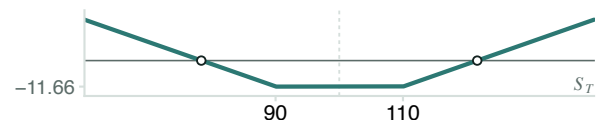
Build: buy a call and a put at K ; e.g. 100, cost 19.76. **View:** a big move either way (long volatility); cost over S_0 is the move priced in. Strip (1C + 2P) leans down, strap (2C + 1P) up.



Max profit unlimited · **Max loss** cost = 19.76 · **Break-evens** $K \pm \text{cost} = 80.24, 119.76$

Strangle

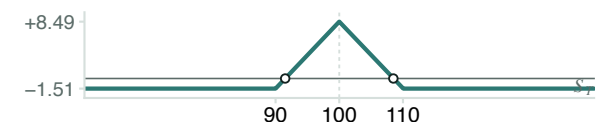
Build: buy an out-of-the-money put at K_1 and call at K_2 ; e.g. 90/110, cost 11.66. **View:** a very big move; cheaper than a straddle, dead between the strikes.



Max profit unlimited · **Max loss** cost = 11.66 · **Break-evens** $K_1 - \text{cost}, K_2 + \text{cost} = 78.34, 121.66$

Butterfly

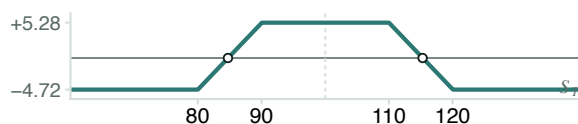
Build: buy calls at K_1 and K_3 , sell two at K_2 ; e.g. 90/100/110, cost 1.51. **View:** the stock ends near K_2 . The payoff is never negative, so a negative price is free money.



Max profit $K_2 - K_1 - \text{cost} = 8.49$ · **Max loss** cost = 1.51 · **Break-evens** $K_1 + \text{cost}, K_3 - \text{cost} = 91.51, 108.49$

Iron condor

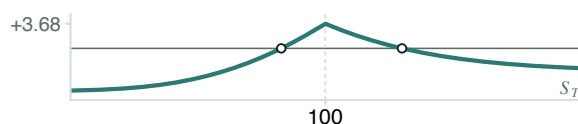
Build: sell a strangle at K_2/K_3 , buy wings at K_1/K_4 ; e.g. 80/90/110/120, a 5.28 credit. **View:** calm, with capped risk: a short strangle with insurance.



Max profit credit = $5.28 \cdot \text{Max loss wing} - \text{credit} = 4.72$ ·
Break-evens $K_2 - \text{credit}, K_3 + \text{credit} = 84.72, 115.28$

Calendar spread

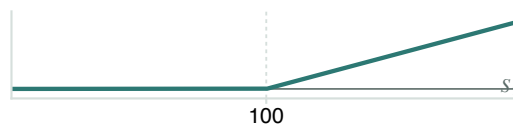
Build: sell a 3-month call (5.47), buy a 1-year call (11.84), both at 100; cost 6.37. **View:** the stock sits near K while the near option decays faster. Diagram: at the near expiry, 25% volatility.



Max profit at K , far call 10.05 – cost = 3.68 · **Max loss** about the cost, 6.37 (on a crash; less on a big rise) ·
Break-evens (model) 93.09, 112.05

Principal-protected note

Build: a zero-coupon bond plus a call. **View:** your money back plus part of the upside: the issuer spends the bond's interest on an option.



Example: invest 100. The one-year zero costs $100e^{-0.04} = 96.08$; the 3.92 left buys 33% of an at-the-money call (11.84). Lower rates or higher volatility shrink that share, so issuers lengthen the term, raise the strike or cap the return.

Pick by view

YOUR VIEW	STRATEGY
Up, not far	Bull call or put spread, covered call
Up, almost free	Risk reversal
Down, cheaply	Bear put or bear call spread
A floor	Protective put, collar
Big move	Straddle, strangle, strip, strap
Stays put	Butterfly, iron condor, calendar
Own it later	Synthetic forward
Lend or borrow	Box spread
Money back	Principal-protected note