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Craps house-edge reference — every bet on the layout, its exact figure, and the 36- outcome derivation behind it

From the pass line at $7/495$ to Any 7 at one sixth — every craps wager priced in closed form, plus the free-odds derivation that shows why one bet on the table costs exactly nothing.

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Educational reference on casino table-game mathematics — not gambling advice, not an app, no affiliate links.

2026 edition · Week 30 · An encyclopedia of the table

Everything comes from 36 outcomes

Two dice produce 36 equally likely ordered outcomes. Craps has no deck composition to track and no dealer decision to anticipate, so the entire game is derived from the table below. The seven is the most frequent total at 6 ways in 36 — it wins on the come-out and kills the point phase, the same number switching sides depending on which phase you are in.

Ways to roll each total with two dice

Total	2	3	4	5	6	7	8	9	10	11	12
Ways (of 36)	1	2	3	4	5	6	5	4	3	2	1

The come-out roll

win on 7 or 11 = $8/36$ · lose on 2, 3 or 12 = $4/36$ · establish a point = $24/36$

The come-out favours the pass bettor two to one. Two thirds of come-outs establish a point, and the point phase is where the house recovers its margin.

Making a point

$P(\text{make point}) = \text{ways}(\text{point}) \div [\text{ways}(\text{point}) + 6]$

Point probabilities and the true odds they imply — note the final two columns are identical

Point	Ways	P(make it)	True odds against	Free odds pay
4 or 10	3	$3/9 = 1/3 \approx 33.3\%$	2 to 1	2 to 1
5 or 9	4	$4/10 = 2/5 = 40.0\%$	3 to 2	3 to 2
6 or 8	5	$5/11 \approx 45.5\%$	6 to 5	6 to 5

The pass line, resolved

$P(\text{win}) = 8/36 + 2 \times [(3/36)(1/3) + (4/36)(2/5) + (5/36)(5/11)] = 244/495 \approx 0.49293$

house edge = $1 - 2 \times (244/495) = (495 - 488)/495 = 7/495 \approx 1.4141\%$

Not an approximation and not a simulation result. Seven parts in 495, permanently, regardless of shooter, table or streak. Don't pass runs slightly cheaper at $27/1980 \approx 1.364\%$, because the 12 on

the come-out pushes rather than winning for the dark side.

Free odds — the only wager in the building priced at cost

on the 4: $(+2 \times 1/3) + (-1 \times 2/3) = 0$

on the 5: $(+1.5 \times 2/5) + (-1 \times 3/5) = 0$

on the 6: $(+1.2 \times 5/11) + (-1 \times 6/11) = 0$

Zero on every point, exactly. The odds bet may only be placed behind a line bet that does carry an edge — the free odds are attached to a priced hook, not a gift.

What odds change, and what they do not

average odds wagered per come-out = $(6/36)(3) + (8/36)(4) + (10/36)(5) = 100/36 \approx 2.778$
units

edge per unit staked = $(7/495) \div 3.778 \approx 0.374\%$

Your line bet keeps its 1.41% whatever you place behind it. Odds enlarge the denominator, not shrink the expected loss. Same cost in dollars, more money exposed, wider swings. "Odds lower the house edge" is a statement about efficiency of exposure, not about paying the house less.

Reference table — lowest edge to highest

Each figure is an exact closed-form value at the stated payout

Bet	Pays	House edge	Premise
Pass line + 3-4-5x odds	even + true odds	$\approx 0.374\%$	Per unit staked across line and odds
Don't pass	even money	$\approx 1.364\%$	12 pushes on the come-out
Pass line (no odds)	even money	$7/495 \approx 1.414\%$	Exact closed form
Place 6 or 8	7 to 6	$1/66 \approx 1.515\%$	Bet in multiples of 6
Field	2:1 on 2, 3:1 on 12	$1/36 \approx 2.778\%$	5.556% if both ends pay 2:1

Place 5 or 9	7 to 5	4.000%	Bet in multiples of 5
Buy 4 or 10	2 to 1 less 5%	$\approx 4.762\%$	Commission paid up front, win or lose
Place 4 or 10	9 to 5	6.667%	Bet in multiples of 5
Big 6 / Big 8	even money	$1/11 \approx 9.091\%$	Strictly worse than placing the number
Hard 6 / Hard 8	9 to 1	$1/11 \approx 9.091\%$	Loses to any 7 or easy way
Any craps	7 to 1	$1/9 \approx 11.111\%$	One-roll bet
Yo (11)	15 to 1	$1/9 \approx 11.111\%$	One-roll bet
Hard 4 / Hard 10	7 to 1	$1/9 \approx 11.111\%$	Loses to any 7 or easy way
2 or 12	30 to 1	$5/36 \approx 13.889\%$	One-roll bet, single way to win
Any 7	4 to 1	$1/6 \approx 16.667\%$	The most expensive bet on the table

Payouts vary between properties. A field paying 2:1 on both ends instead of 3:1 on the 12 doubles that bet's edge to 5.556%; a Buy commission charged only on wins rather than up front changes the 4.762% substantially. Read the felt, not the folklore.

The shape of the layout

- The cheapest and the most expensive bets sit about eleven inches apart on the same table.
- Line bets and odds run 0.37%–1.41%; the centre propositions run 9%–16.67%.
- That spread is roughly twelvefold, and the expensive bets are printed in the largest type.
- Zero edge is not zero risk — the odds bet still carries full variance on real money.

Full derivation at betcanon.com/first-principles/craps-pass-line-and-free-odds/

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