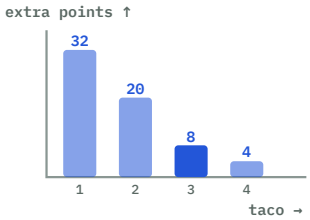
Why do you stop at the second taco?

One buyer, one budget: extra satisfaction shrinks, so she spreads her money until the last dollar on each good adds the same. Change a price and her choices trace her demand curve.

1 Utility

points, total and extra

- **Utility** = satisfaction from a good, scored in **points** (made up: only comparisons matter)
- **Total utility** (TU) = all points so far · **marginal utility** (MU) = extra points from one more unit `= TU after − TU before`
- **Diminishing marginal utility** ⇒ each unit adds less (hunger shrinks) · Nadia's tacos 32 → 20 → **8** → 4 · TU 32, 52, **60**, 64 ⇒ 3rd taco `60 − 52 = 8`
- Practice · Ravi's pizza TU 24, 40, 50, 56, 58 ⇒ MU 24, 16, **10**, 6, 2



2 Points per dollar

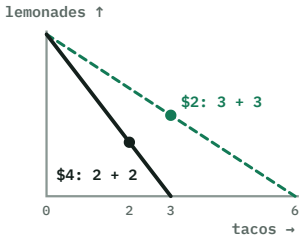
the rule

- Compare goods by `MU ÷ P` (P = price), not by points alone · taco $4, lemonade $2, budget $12
- Spend each dollar where it adds most: 1st taco 8 · 1st lemonade 7 · 2nd taco **5** · 2nd lemonade **5** ⇒ $12 gone
- **Utility-maximizing rule** ⇒ $MU_{taco} \div P_{taco} = MU_{lemon} \div P_{lemon}$ · `20 ÷ 4 = 10 ÷ 2 = 5` ⇒ best bundle **2 + 2 = 76** points (3 + 0: 60 · 1 + 4: 66 · 0 + 6: 37)
- Whole items ⇒ **as close as possible**, not always exactly equal
- Practice · Ravi $10, pizza $2, juice $1 ⇒ **3 slices + 4 juices = 79** · last slice 10 ÷ 2 = 5 = last juice 5 ÷ 1

3 Budget line

improve a bundle

- **Bundle** = a mix of goods, e.g. 2 tacos + 2 lemonades
- **Budget line** = every bundle that spends the whole budget $P_A \times A + P_B \times B = income$ (P = price; A, B = how many of each good) · below: money left · above: unaffordable
- Nadia: 3 tacos ↔ 6 lemonades · drag along ⇒ best **2 + 2**
- **Improve a bundle** ⇒ compare per $ the **last** unit you give up with the **next** one you buy · new one adds more ⇒ swap
- Omar 3 tacos = 60 · last taco 8 ÷ 4 = **2** per $ · 1st lemonade 14 ÷ 2 = **7** ⇒ swap: −8 + 14 + 10 ⇒ **76**
- Practice · Mia 1 + 8 = 60 → 2 + 6 = 74 (−1 −1 +16) → 3 + 4 = 79 (−3 −2 +10) · next swap −6 −5 +6 ⇒ **stop**



4 Price change

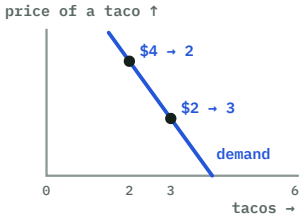
two effects

- Tacos $4 → $2 ⇒ line swings out · best 2 + 2 → **3 + 3 = 90** points ⇒ more tacos
- **Substitution effect** = buy more of the good that got cheaper next to its alternative (a taco: 2 lemonades → 1)
- **Income effect** = a price change acts like a change in income · old 2 + 2 now $8 ⇒ $4 left ⇒ more of both (3rd lemonade)
- Practice · pizza $2 → **$3** (a rise) ⇒ 3 + 4 → **2 + 4 = 69** · old bundle now $13 for $10 ⇒ income ↓ both · substitution: pizza ↓, juice ↑ ⇒ juice stays 4

5 Demand curve

from one buyer to the market

- Best bundle at each price = one buyer's **demand curve** · Nadia: $4 → 2 tacos · $2 → 3 tacos · Ravi: $2 → 3 slices · $3 → 2
- Slopes down because of **diminishing MU** (law of demand) · **market demand** = sum of every buyer's quantity at each price (Lesson 2)
- **Paradox of value** (Adam Smith, Scottish economist, 1776): water vital and cheap, diamonds nearly useless and expensive ⇒ price follows the **marginal** unit, not the total



Watch out: more points per item ≠ better buy ⇒ divide by the price · equal MU ÷ P, not equal MU · a good whose price did not change can still move (income effect)