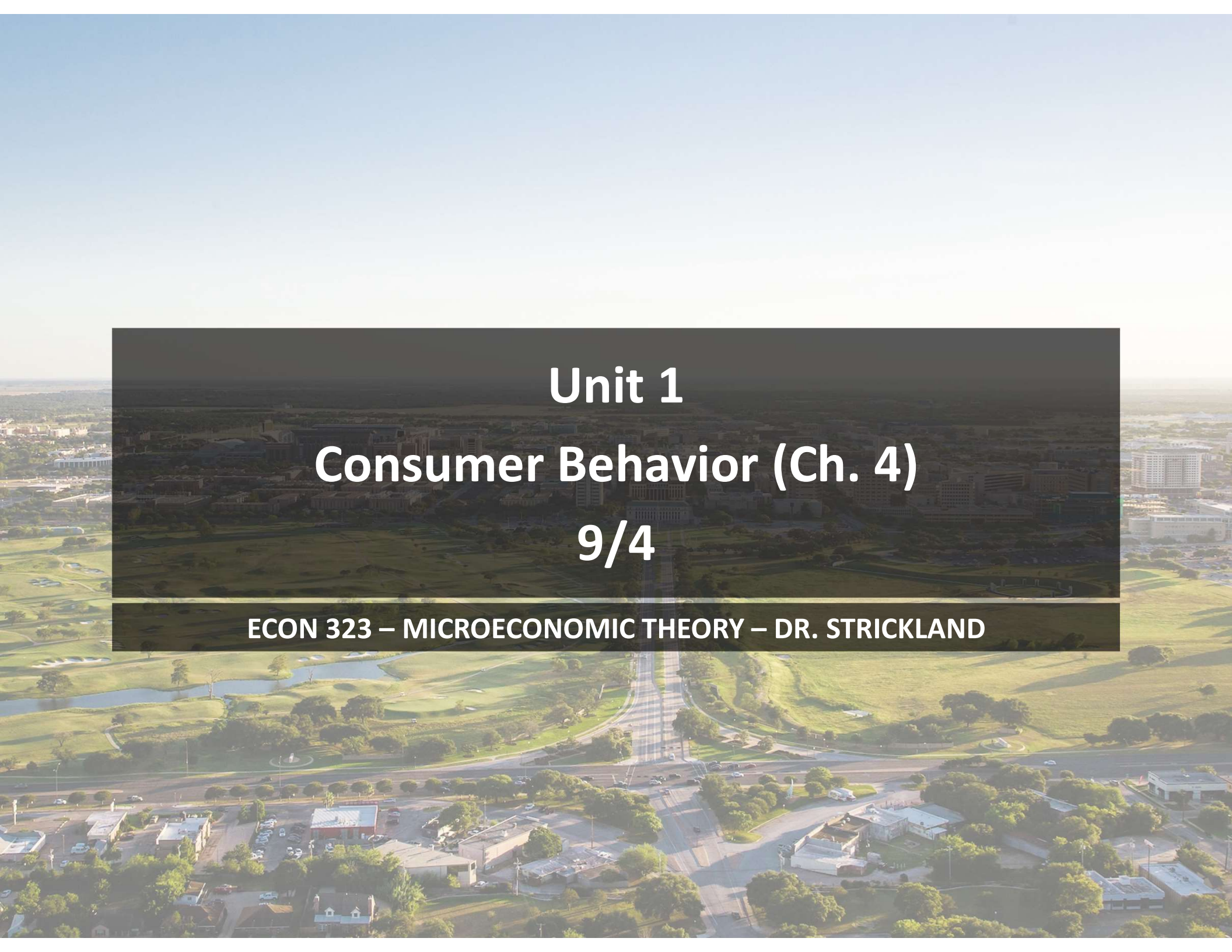


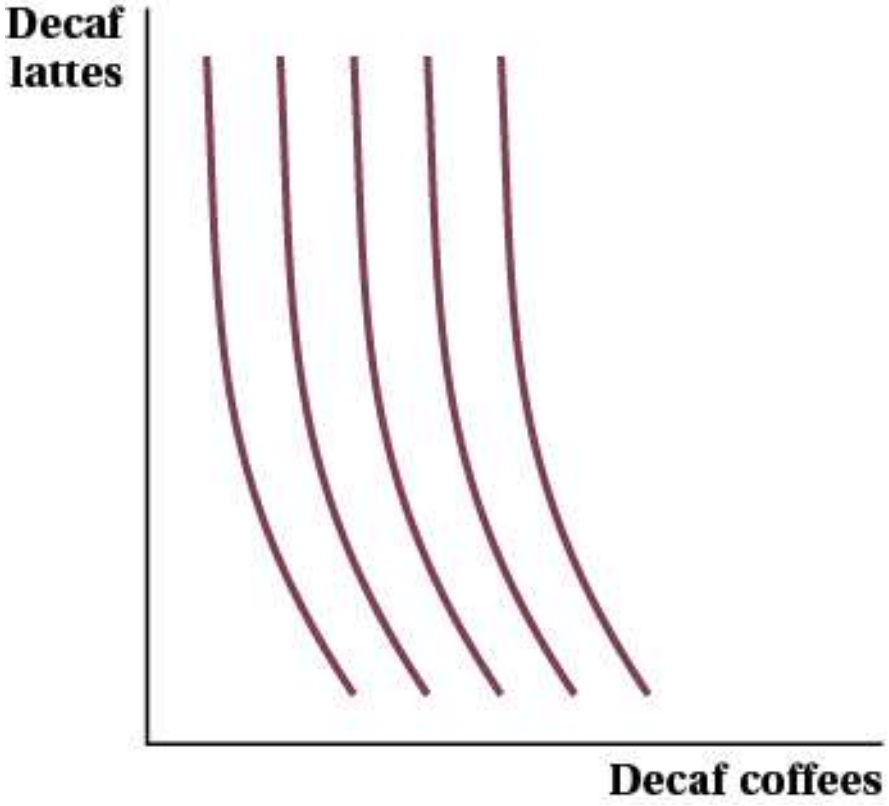
# Unit 1
# Consumer Behavior (Ch. 4)
# 9/4

ECON 323 – MICROECONOMIC THEORY – DR. STRICKLAND

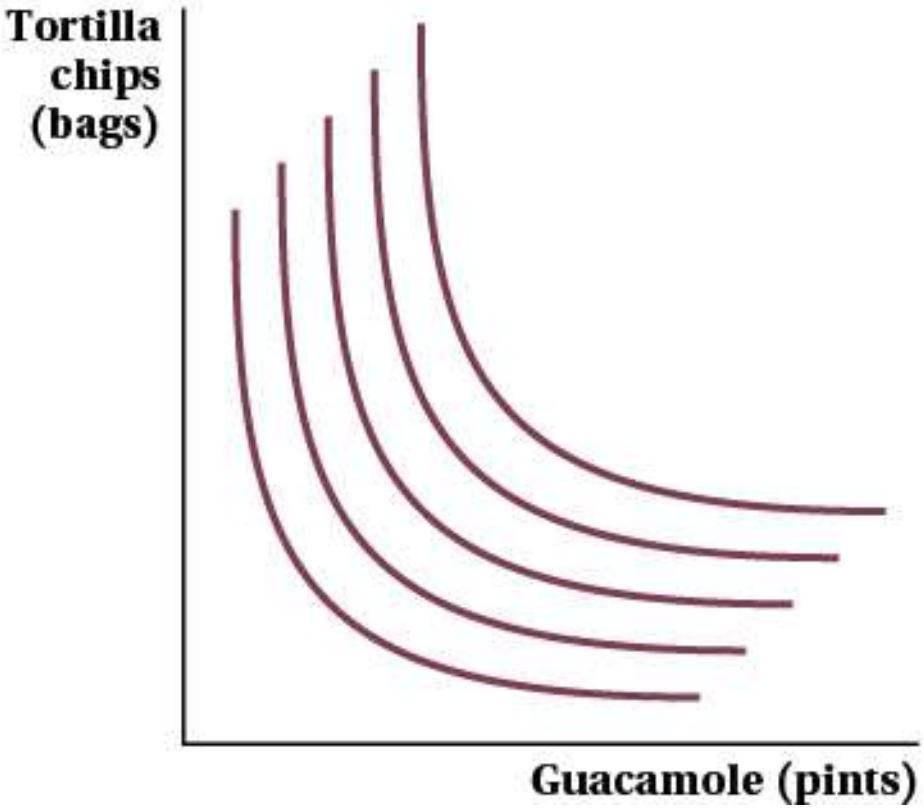
# Curvature of Indifference Curves

* IMPERFECT SUBSTITUTES * $U = x^a y^b$

(a) Almost Straight Indifference Curves



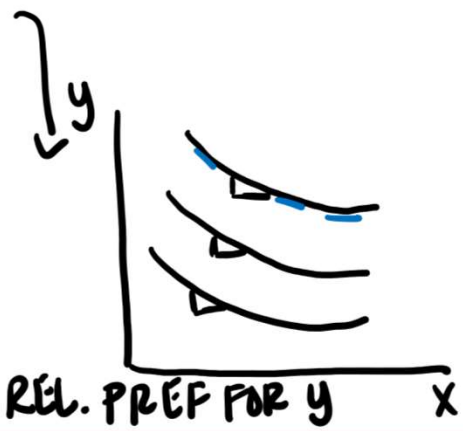

(b) Very Curved Indifference Curves



# iClicker

A dermatologist puts 1oz of sunscreen on her body every 2 hours she is in the sun. Consider a graph of her indifference curves, where ounces of sunscreen is on the x-axis and time in the sun is on the y-axis. Her indifference curves are most likely:

A. To be L-shaped PERFECT COMPS
B. To have a constant MRS (marginal rate of substitution) PERFECT SUBS
C. To be curved and relatively flat IMPERFECT SUBS
D. To have a constant slope PERFECT SUBS



# The Consumer's Income and the Budget Constraint

In addition to preferences, consumers also have budgets

- Goods cost money!
- Income is limited!

**Budget constraint:** the entire set of consumption bundles a consumer can purchase when spending all their income.

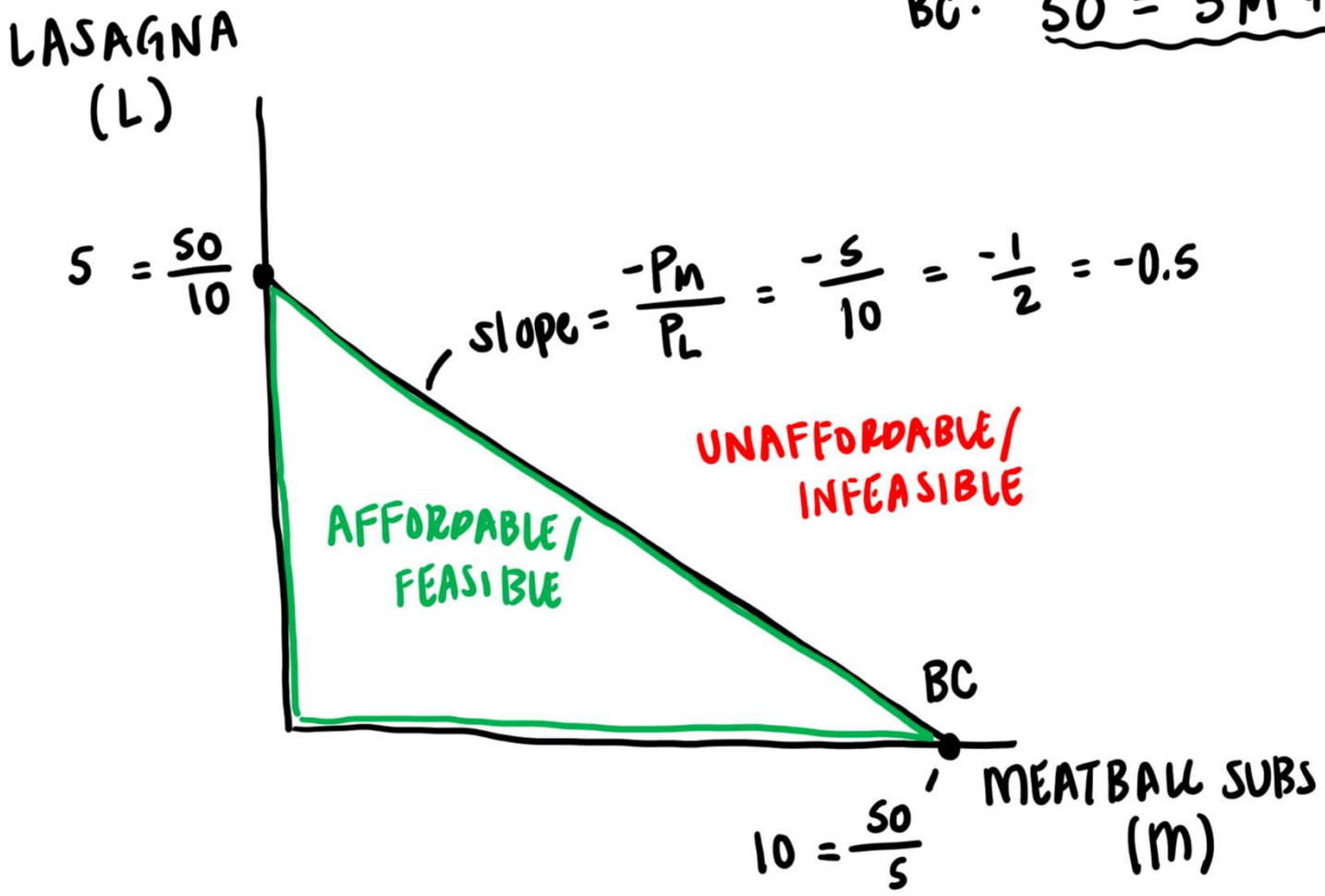
$$BC: \; I = P_x \cdot X + P_y \cdot y$$

# The Consumer's Income and the Budget Constraint

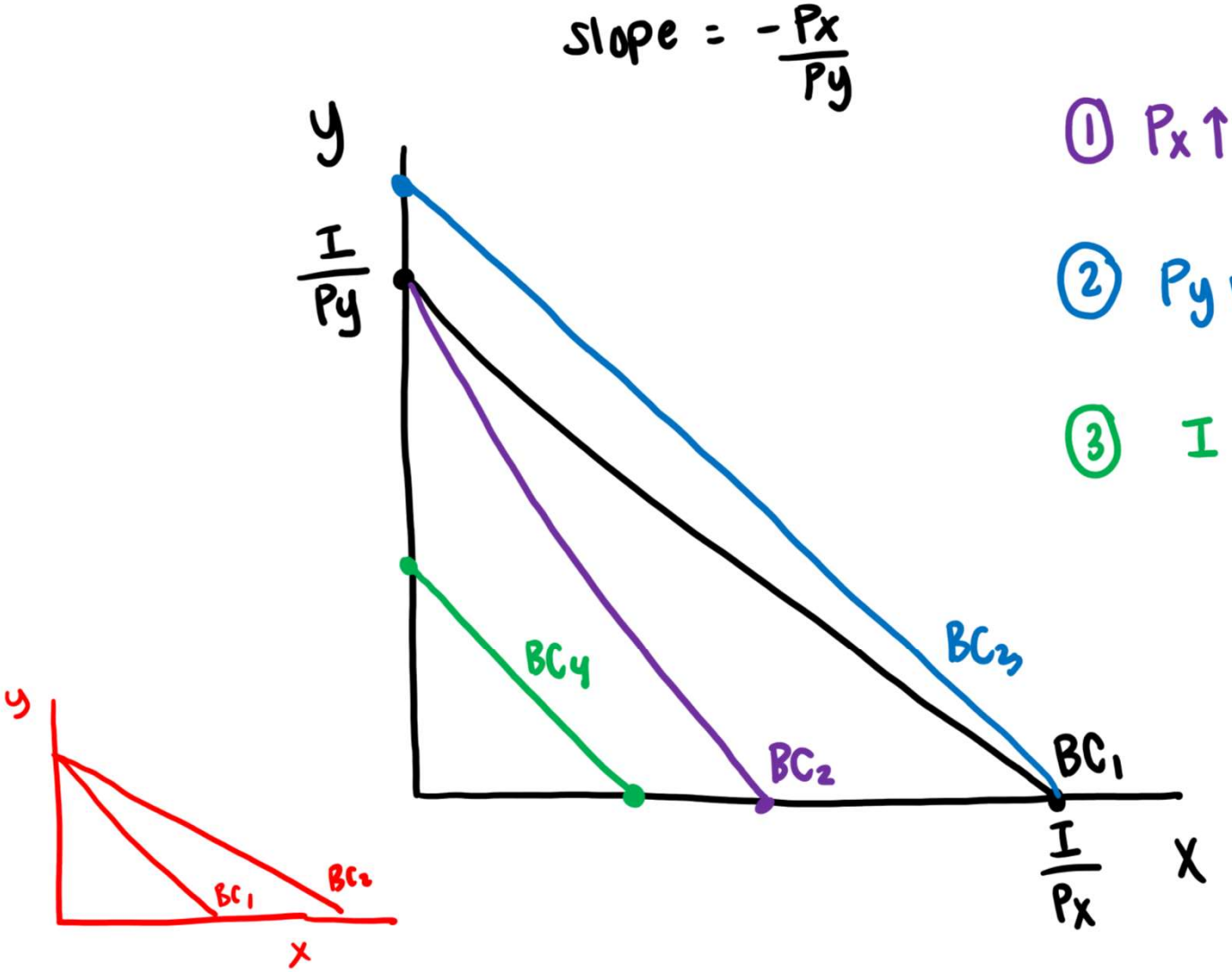
BC: $I = P_x \cdot X + P_y \cdot y$

$I = \$50$, $P_m = \$5$, $P_L = \$10$

Joey's BC: $50 = 5M + 10L$



# The Effects of Price or Income Changes on the Budget Constraint







① $P_x \uparrow \Rightarrow BC_1$ ROTATES INWARD TO $BC_2$

② $P_y \downarrow \Rightarrow BC_1$ ROTATE OUTWARD TO $BC_3$

③ $I \downarrow \Rightarrow BC_1$ SHIFT INWARD TO $BC_4$

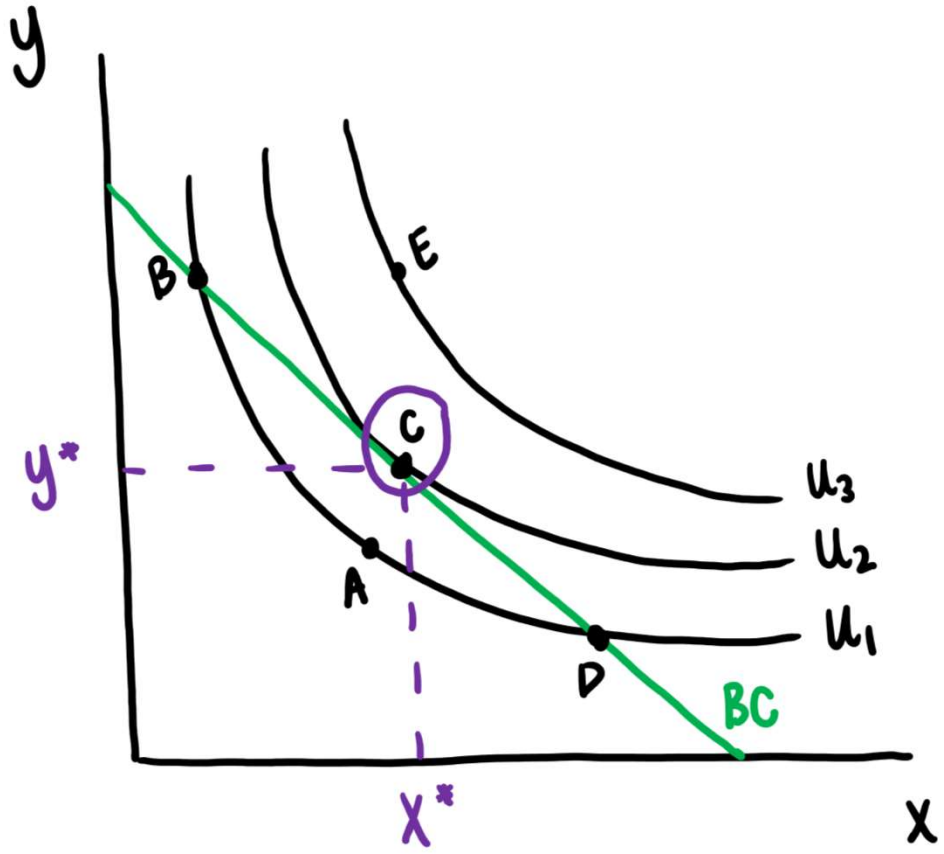
# Consumer Choice: Utility Maximization

Choice depends on preferences and budgets

- Preferences → utility and indifference curves
- Budgets → budget constraint

This is a **constrained optimization problem**: how do consumers maximize utility subject to income and market prices?

# Consumer Choice: Utility Maximization




*TANGENCY*

# Consumer Choice: Utility Maximization

The **tangency condition** is key to solving many of these problems

- Slopes of the indifference curve and budget constraint are equal

Slope IC = Slope BC

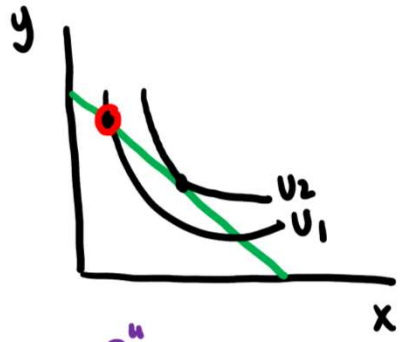
$$-MRS_{xy} = -\frac{P_x}{P_y}$$

$$MRS_{xy} = \frac{P_x}{P_y}$$

"WHAT IS UTILITY MAXIMIZING?"

$$\frac{MU_x}{MU_y} = \frac{P_x}{P_y} \Rightarrow \frac{MU_x}{P_x} = \frac{MU_y}{P_y}$$

"IS THIS UTILITY MAXIMIZING?"




- WHAT IF:

$$\frac{MU_x}{P_x} > \frac{MU_y}{P_y} ?$$

WILL ↑X and ↓Y UNTIL $\frac{MU_x}{P_x} = \frac{MU_y}{P_y}$

# Let's practice!

Kevin gets utility from soda (S) and hotdogs (H); his utility function is given by $U = S^{0.5}H^{0.5}$. His marginal utility for soda is $MU_S = 0.5S^{-0.5}H^{0.5}$. His marginal utility for hot dogs is $MU_H = 0.5S^{0.5}H^{-0.5}$. Kevin's income is \$12, and the prices of sodas and hotdogs are \$2 and \$3, respectively.

**Answer the following:**

What is Kevin's utility-maximizing bundle of sodas and hotdogs?

# Let's practice!

EXPONENT RULES:

$X^{-n} = \frac{1}{X^n}$ $\quad \frac{X^n}{X^m} = X^{n-m}$

$= \frac{0.5 H^{0.5}}{S^{0.5}}$

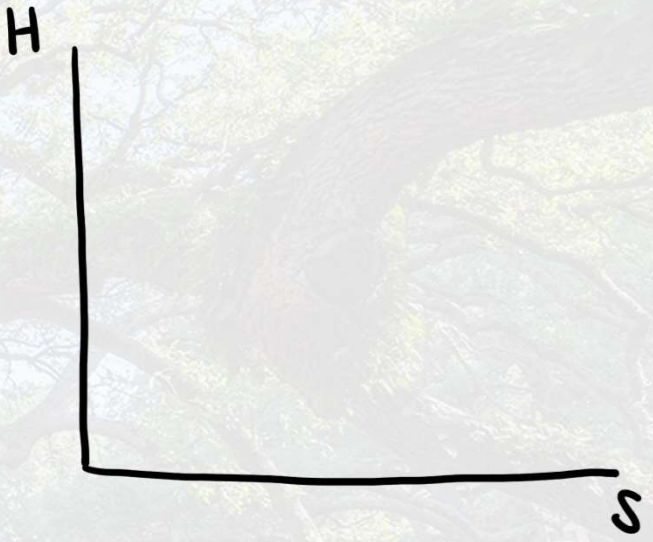
$U = S^{0.5}H^{0.5}$, $MU_S = 0.5S^{-0.5}H^{0.5}$, $MU_H = 0.5S^{0.5}H^{-0.5}$, I=\$12, $P_S$ = \$2, $P_H$ = \$3

① TANGENCY CONDITION: $MRS_{xy} = \frac{P_x}{P_y}$

$MRS_{SH} = \frac{P_S}{P_H} \Rightarrow \frac{MU_S}{MU_H} = \frac{P_S}{P_H}$

$\frac{0.5S^{-0.5}H^{0.5}}{0.5S^{0.5}H^{-0.5}} = S^{-0.5-0.5} \cdot H^{0.5--0.5}$

$= S^{-1} \cdot H^{1} = \frac{H}{S}$




$\frac{H}{S} = \frac{2}{3} \Rightarrow 3H = 2S \Rightarrow H = \frac{2}{3}S$

"OPTIMAL CONSUMPTION RATIO" (OCR)