Consumer Theory: Demand and Changes on prices

Econ 1101

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ECON 1101 Lecture 9.1

1. Recap of Deriving the demand

2. Changes in prices

(a) substitution effect

(b) income: income effect

3. More examples of SE and IE

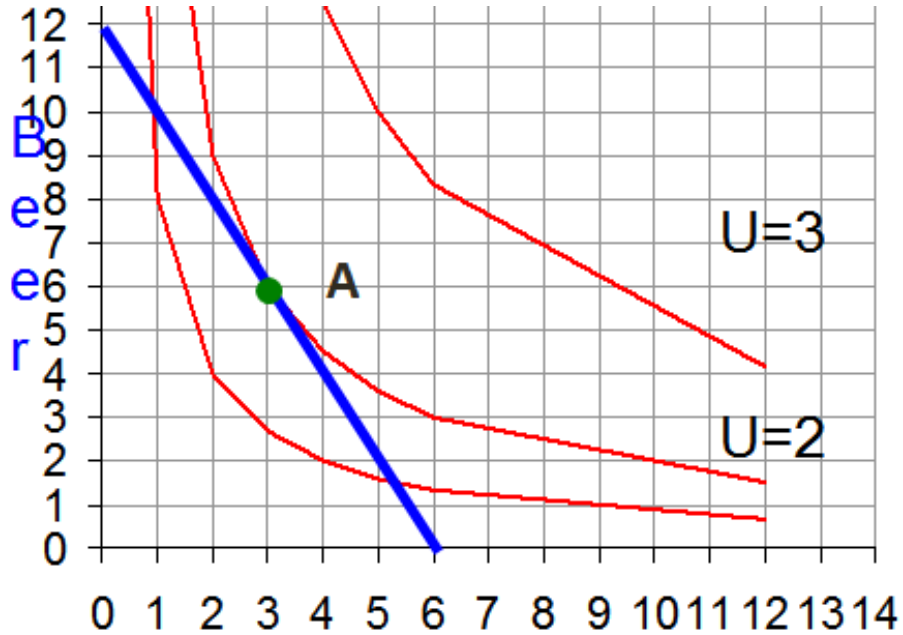
ECON 1101 Lecture 8.3

1. Deriving the demand

Constructing Demand... recall from last class

- Decreasing MRS case
- To derive the demand of pizza (fix income and price of other goods), focus on the relation between quantity demanded and price of pizza
  - quantity demanded of pizza is now coming from the optimal consumption problem of the consumer

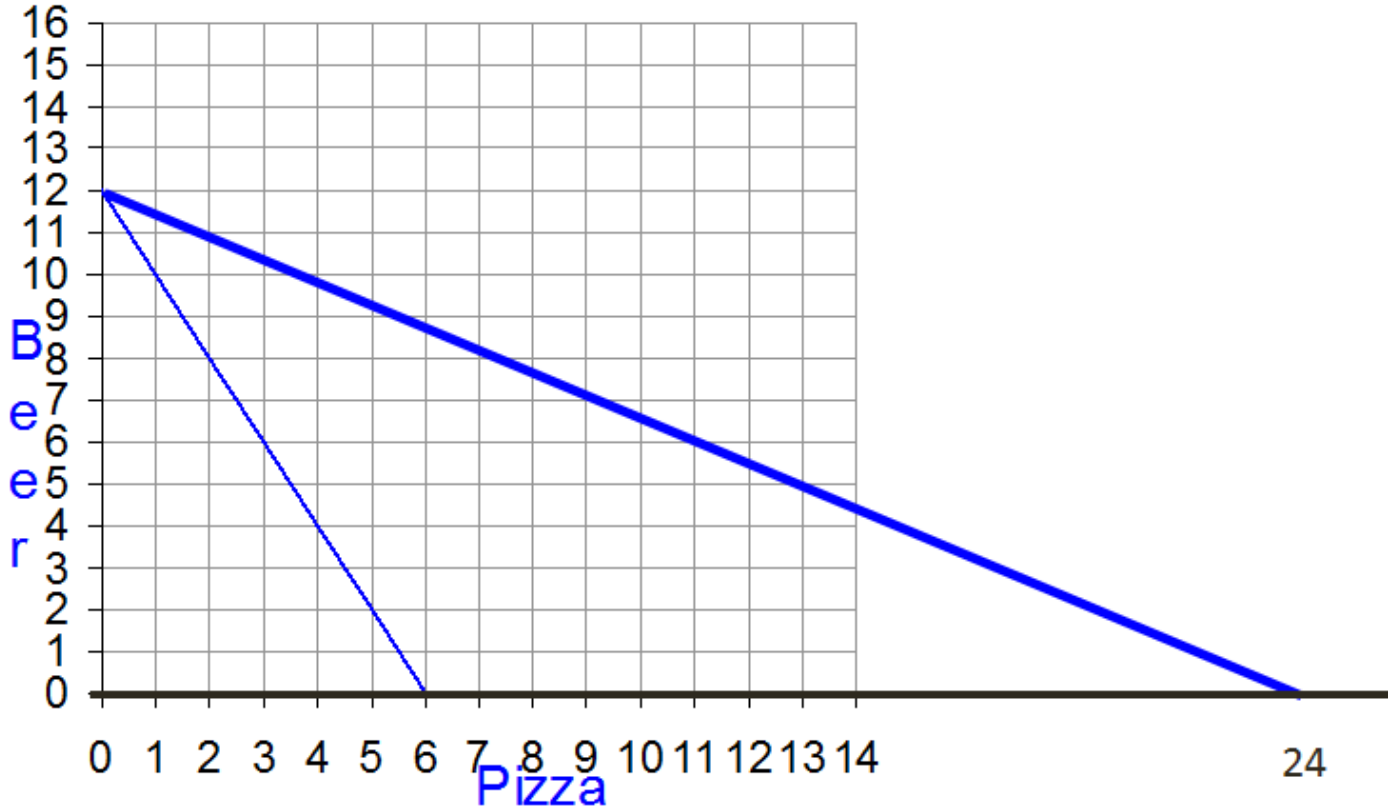
OCB with $I = 24$, $P_b = 2\,P_p = 4$ "A" (beer = 6, pizza=3)



Constructing Demand (of pizza): budget constraint

Let prices vary (everything else remains constant)

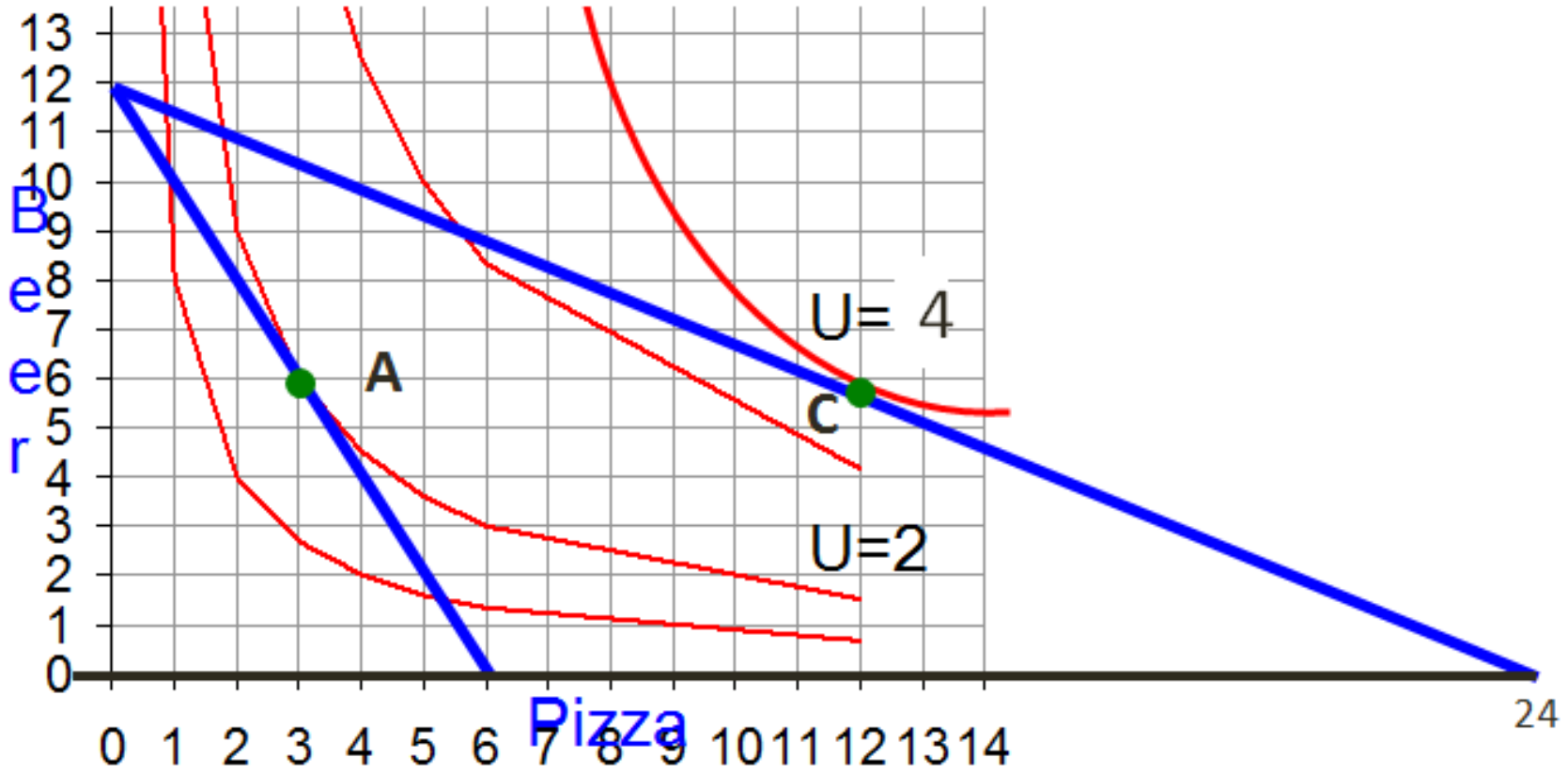
- Original price $P_p = 4$
- New price $P_p = 1$
- New budget constraint (horizontal intercept)



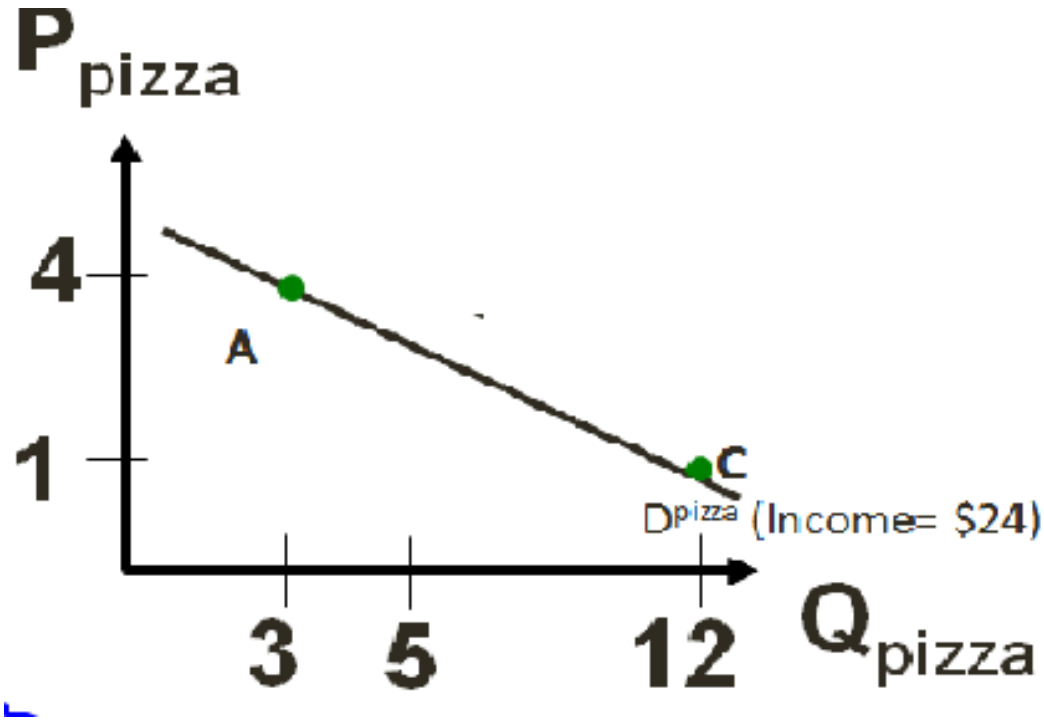
Constructing Demand (of pizza): optimal quantity

With our new BC (given the indifference curve map) get new OCB ("C")

- we have 2 points: "A" ($P_p = 4$, pizza=3) "B" ($P_p = 1$, pizza =12)
- plot them on the p, q graph to get demand



Constructing Demand (of pizza): plotting



Changes in Income (shift of the demand)

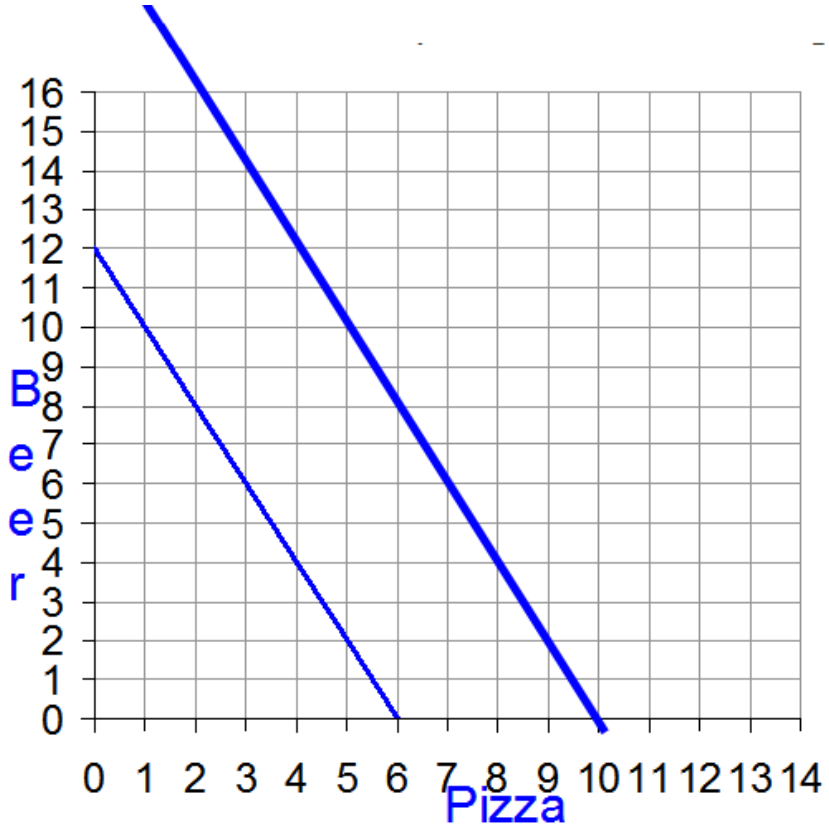
We can also see a change in income (a shift of the curve)

- Suppose income changes from $I = 24$ to $I = 40$
  1. First get new budget constraint
  2. Then get new OCB from the indifference curve map
  3. Plot the new pair $P(pizza)$, quantity of pizza in the demand graph
- This will give a point on a new (shifted demand curve)

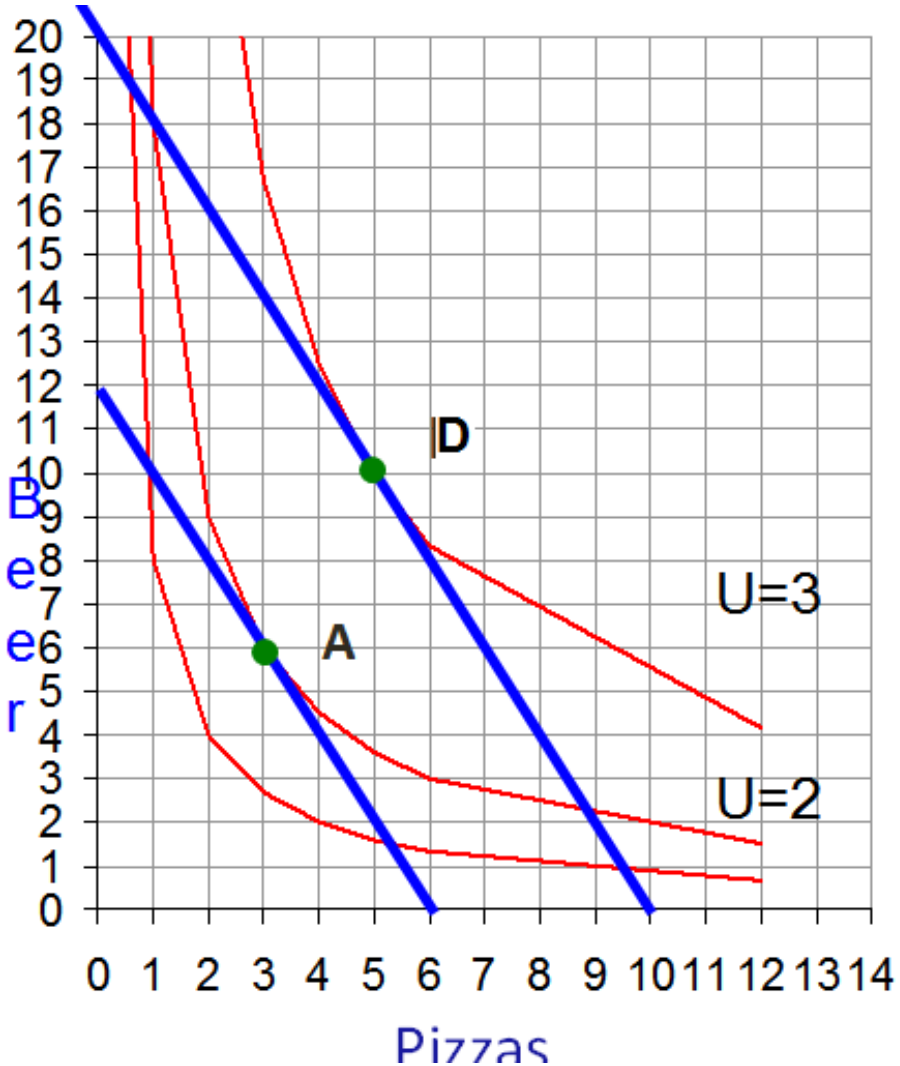
Changes in Income: the BC

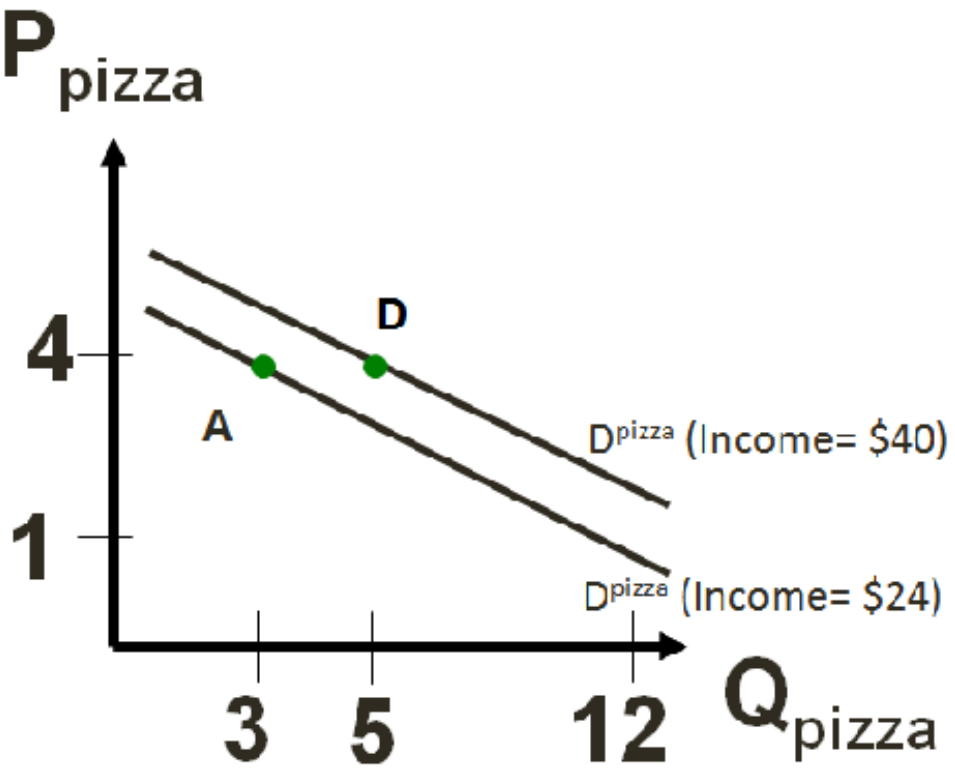
New $I = 40$ (everything else remains the same $Pp = 4 \quad Pb = 2$)

- New budget constraint:
  - vertical intercept $40/2 = 20$
  - horizontal intercept $40/4 = 10$



Changes in Income: new optimal consumption bundle





Effects of the price change

If the price of one good decreases we have two effects:

1. The opportunity cost of "pizza" is now lower
2. Increase in purchasing power (like I have more money now)

We have special names for those 2 effects from price changes on demand:

1. Substitution effect: effect caused by decrease in OC holding purchasing power constant (same IC)
2. Income effect: effect caused by increase in income holding OC constant (same slope)

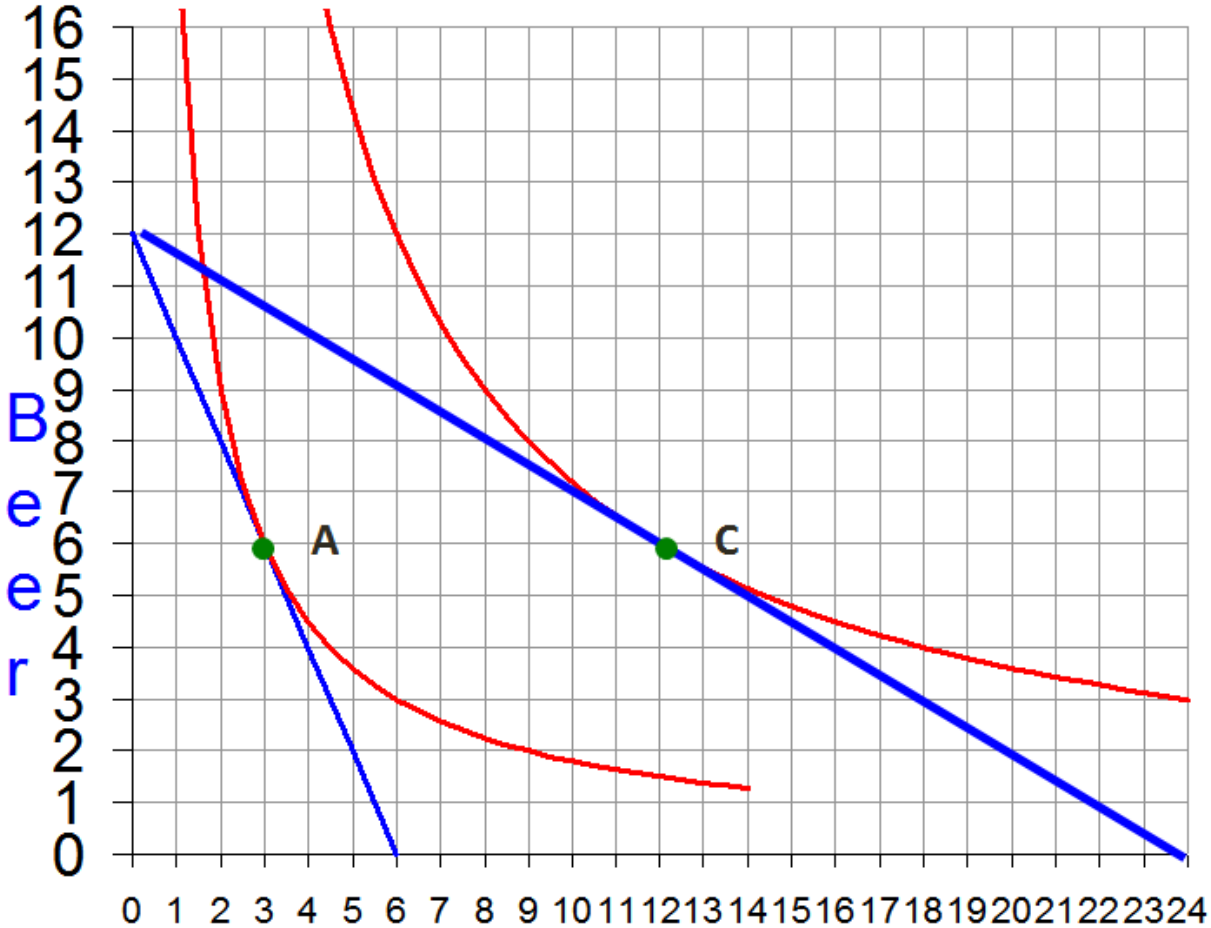
Total effect = Substitution effect + income effect

Total effect

I = \$24 and P_{Beer}=\$2 fixed

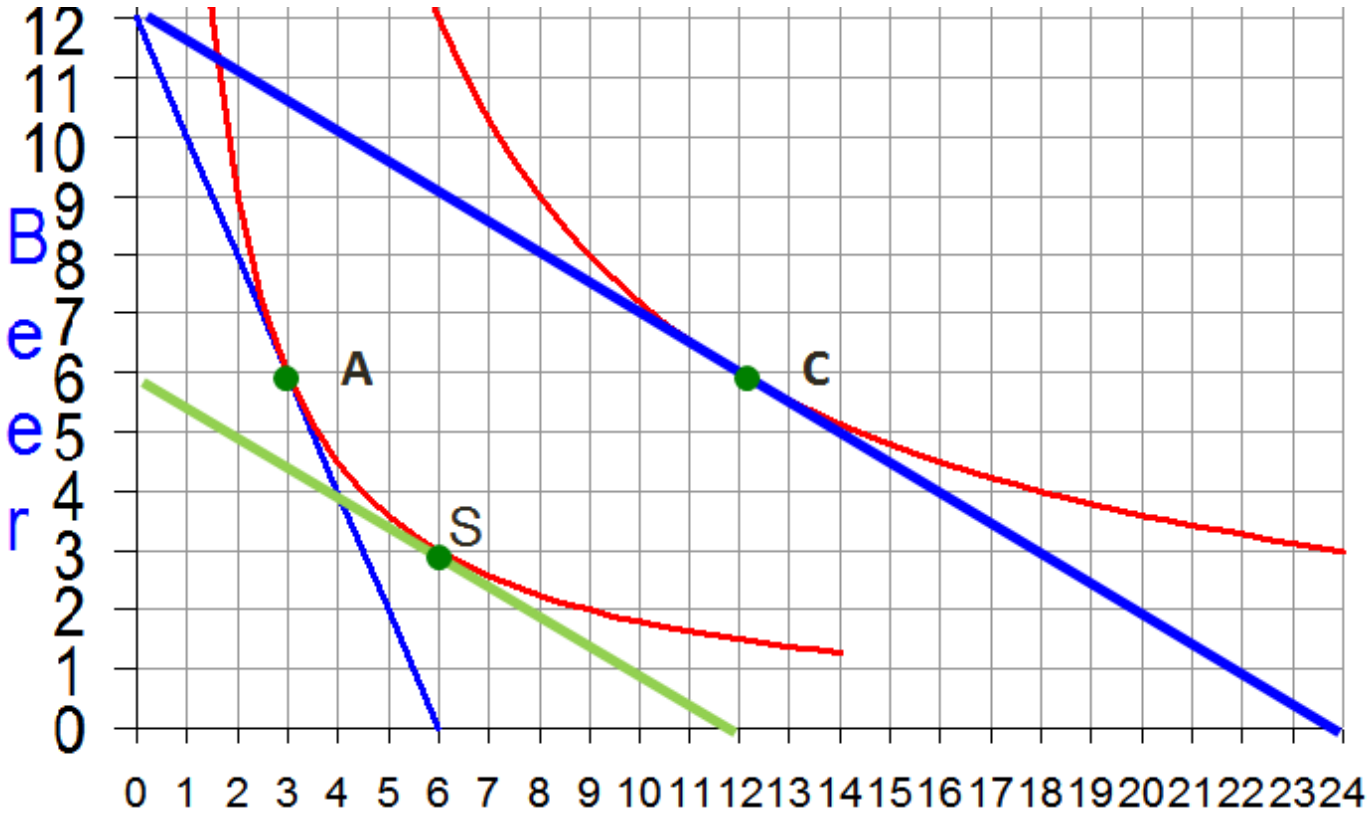
P_{Pizza} = \$4: Label OCB **A**
P_{Pizza} = \$1: Label OCB **C**

Total effect: Change from A to C
- change cheese = 12-3 = 9



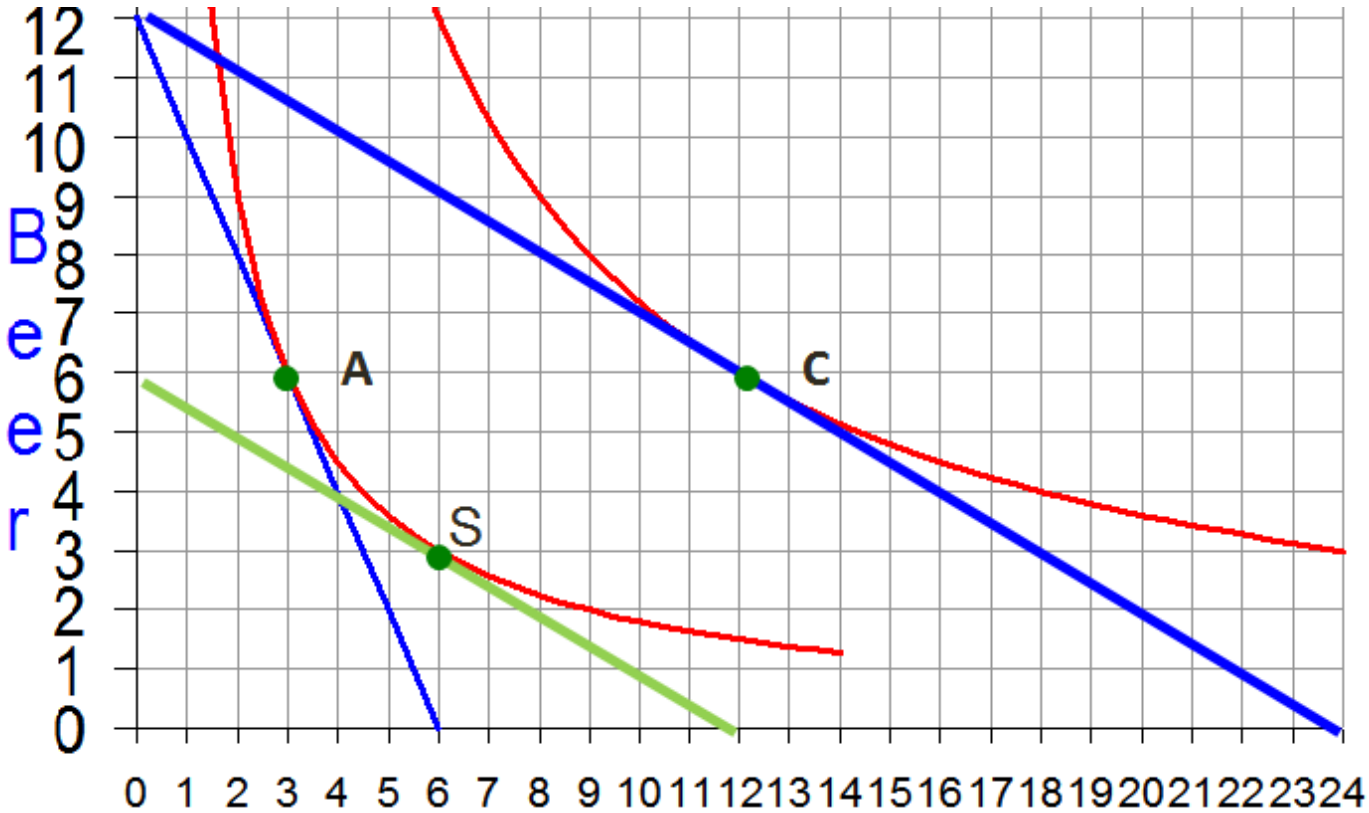
Substitution Effect

1. Hold purchasing power fixed (stay on the original IC curve)
2. But at the new prices (with the slope of the new BC):
   draw a parallel line to the new BC that touches the old IC
3. Now compare A & S: same IC (same income), different slopes (different OC)
4. Substitution effect is the change from A to S $\Delta cheese = 6 - 3 = 3$

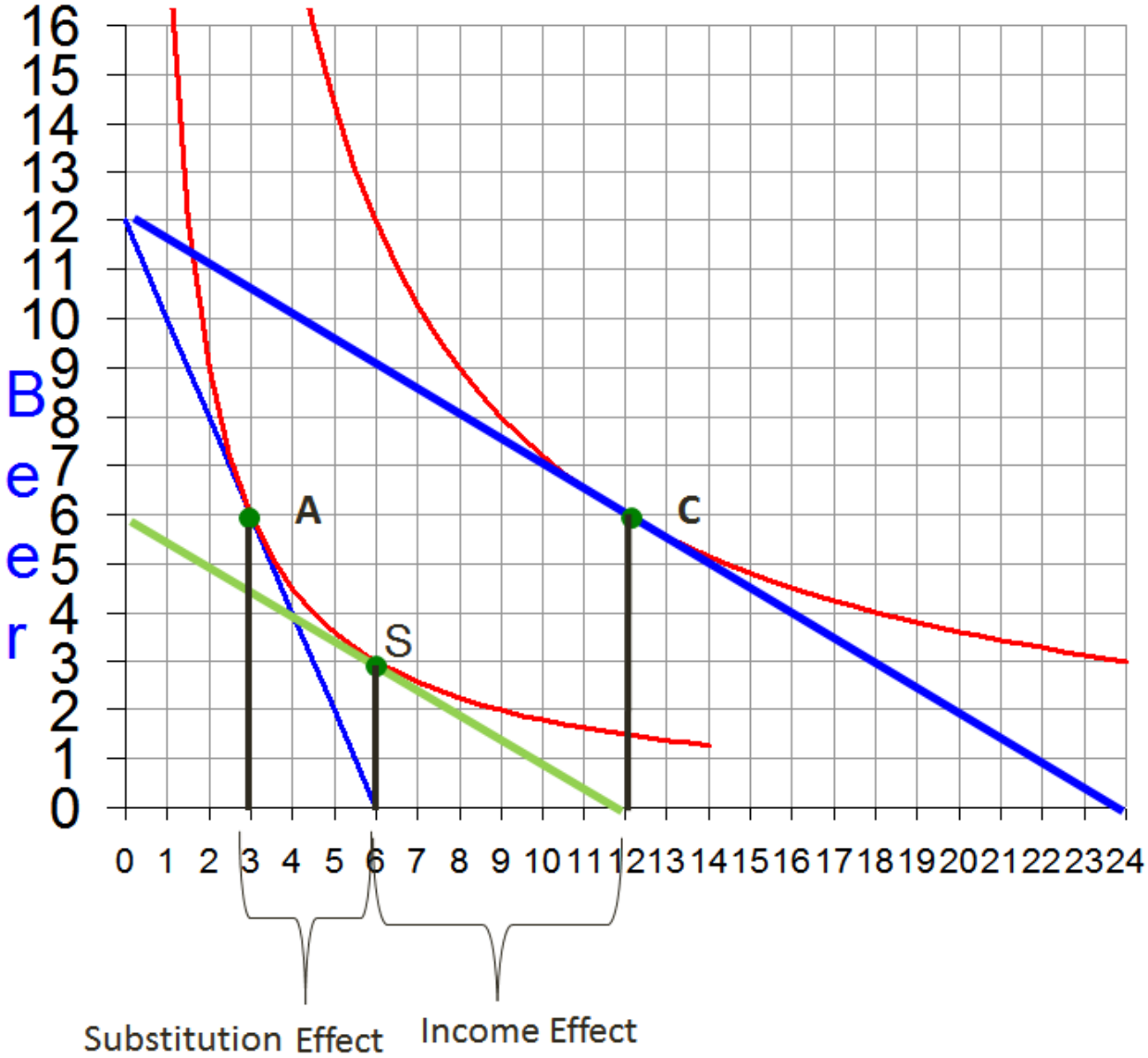


Income Effect

1. Isolate the effect of change in purchasing power, fix change in prices (OC)
2. Use new relative prices (new slope of BC), compare old IC vs new IC (S vs C)
3. Note green line and new BC are parallel, which means same prices but different income
4. Income effect: change from S to C $\Delta cheese = 12 - 6 = 6$



Substitution and Income Effects



SE and IE: Recap

When price of some good A falls:

Substitution effect: buy more of good A (because opportunity cost is lower), but that means buy less of good B

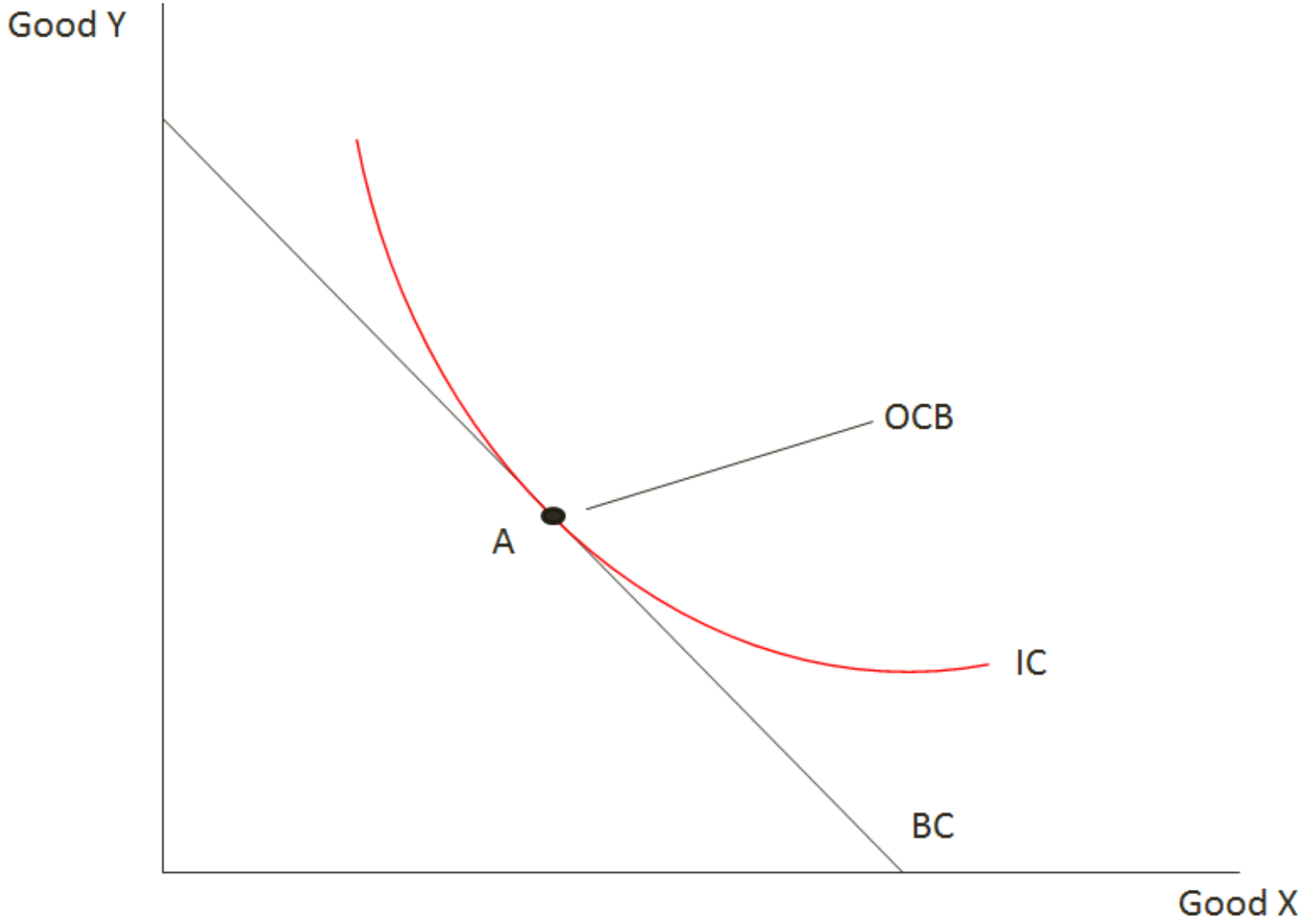
Income effect (since original bundle is cheaper than before so have income left over)

- normal good: buy more
- inferior good: buy less

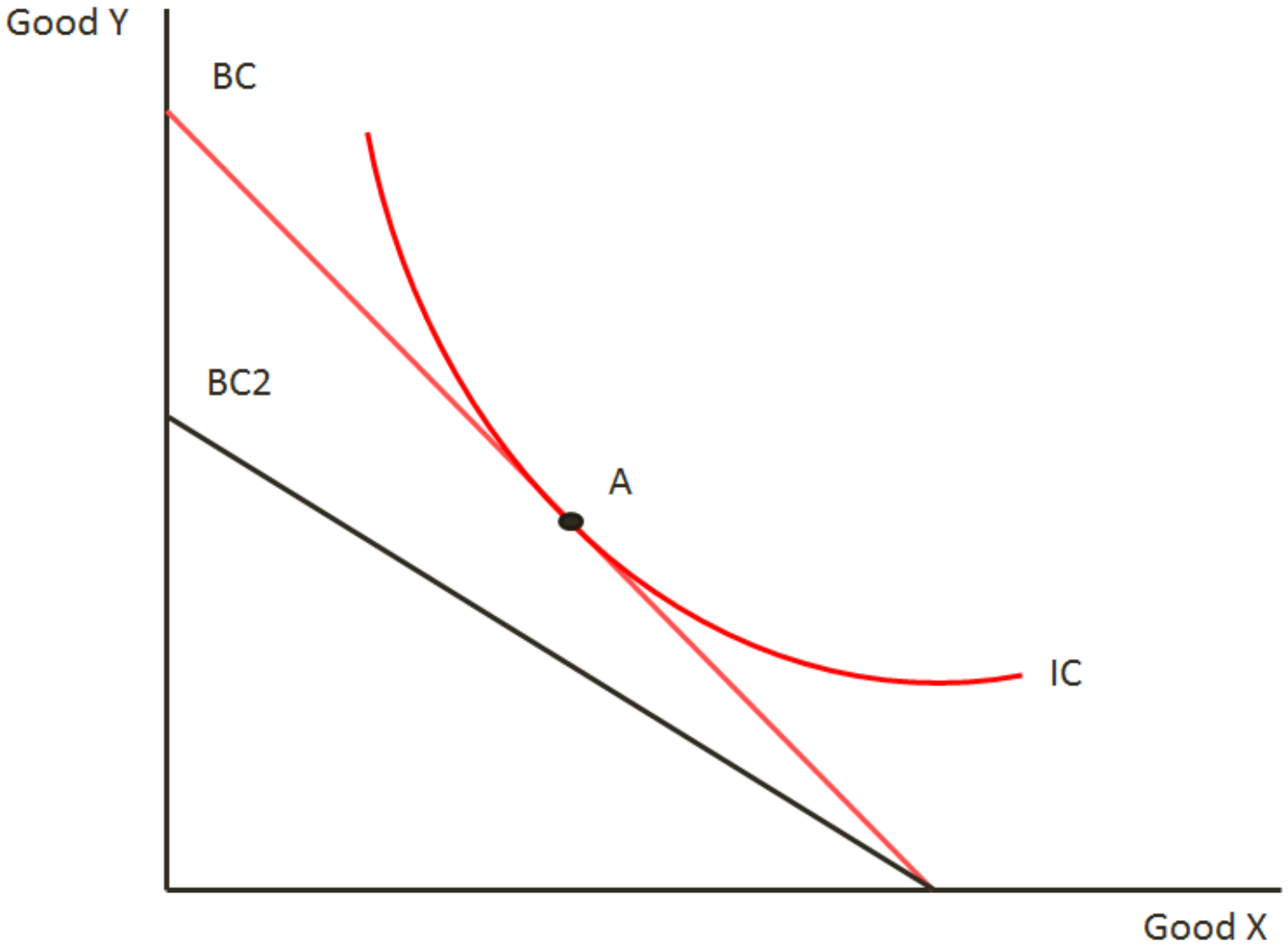
For Good A:

If normal, substitution effect and income effect work same way

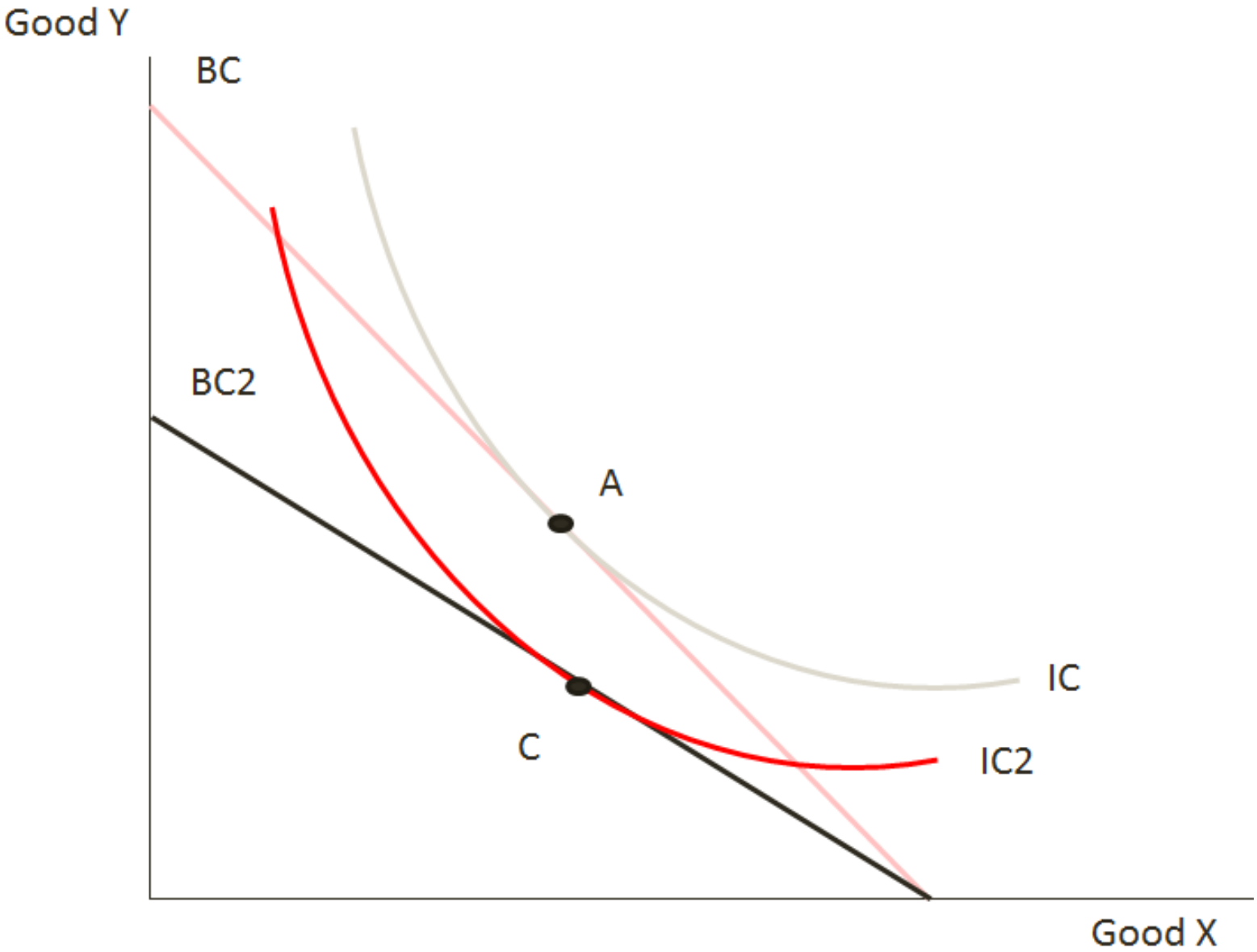
More Examples: Ex1



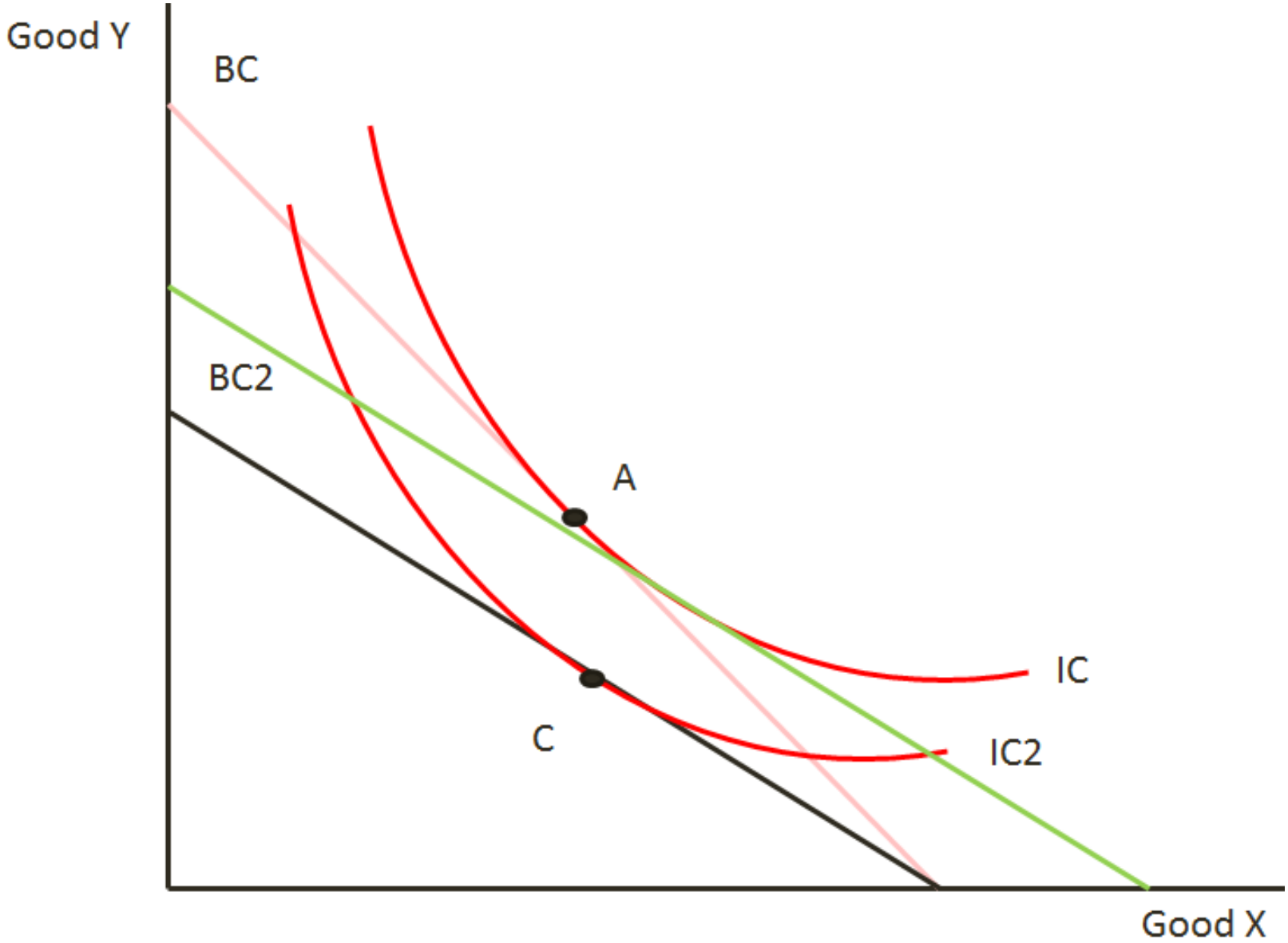
Example 1: price of good Y increases (new BC)



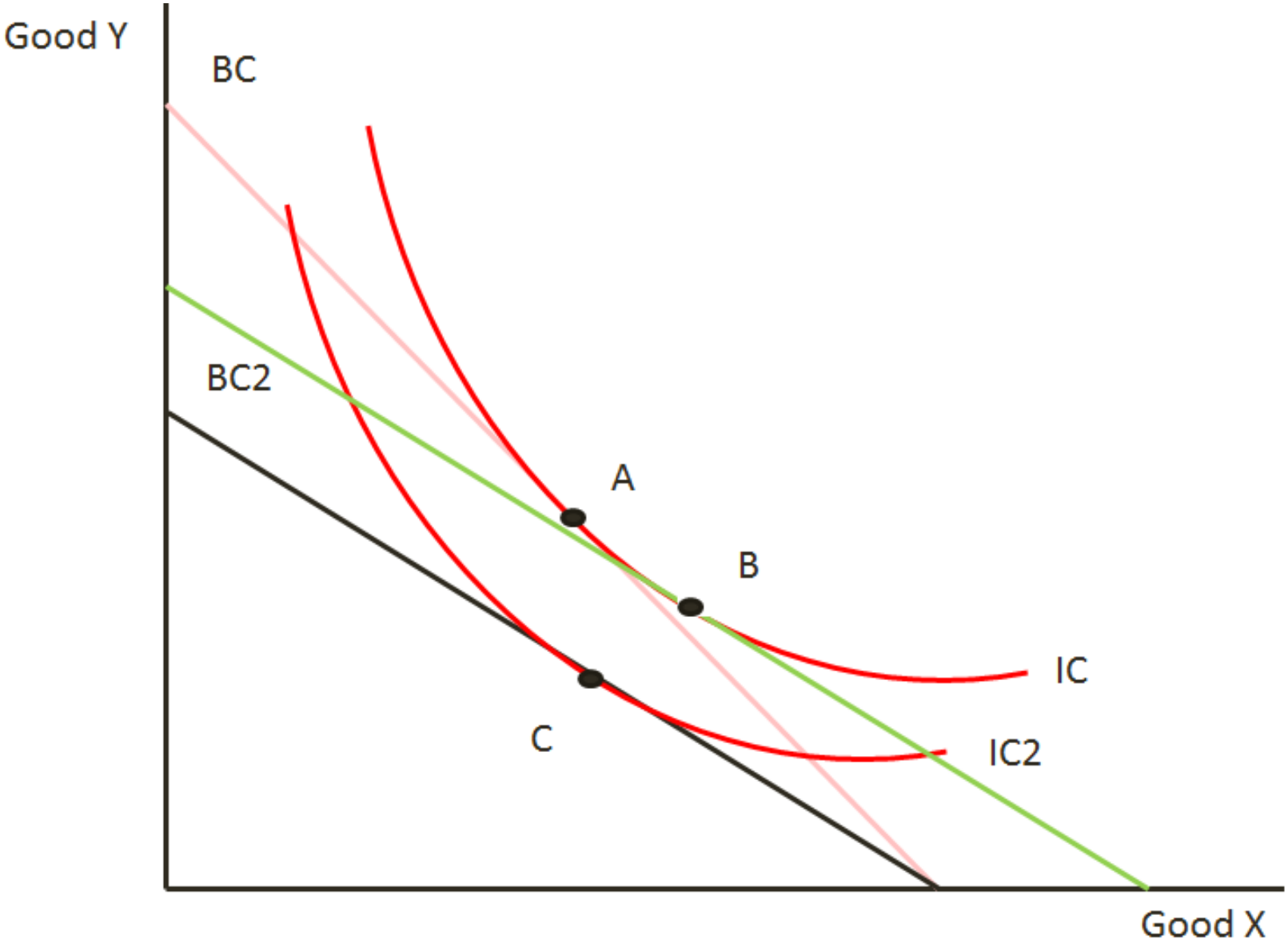
Ex 1: price of good Y increases (new OCB)



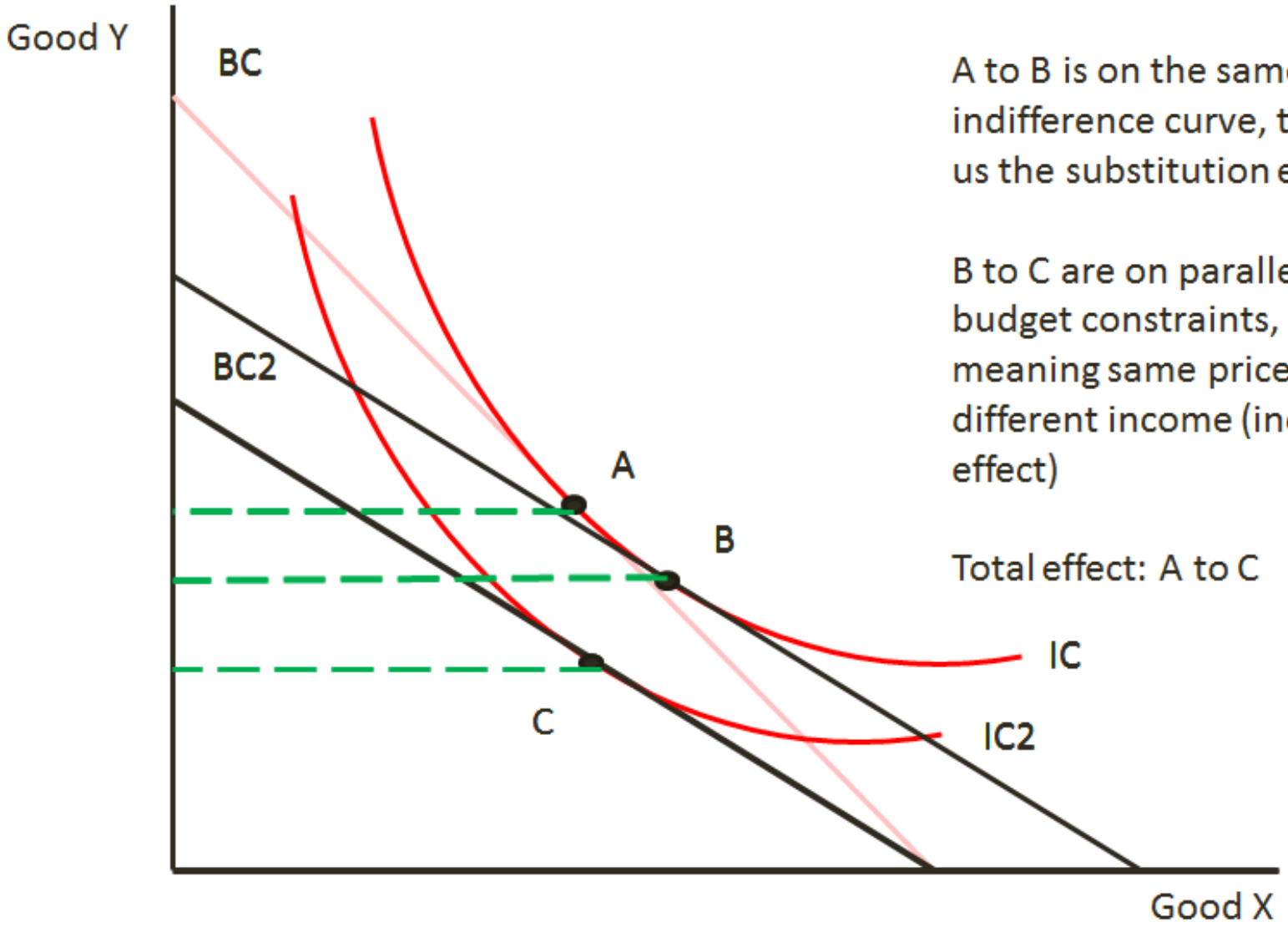
Ex 1: p(y) increases (drawing parallel line - old OC)



Ex 1: p(y) increases (finding point B)



Ex 1: p(y) increases IE, SE TE

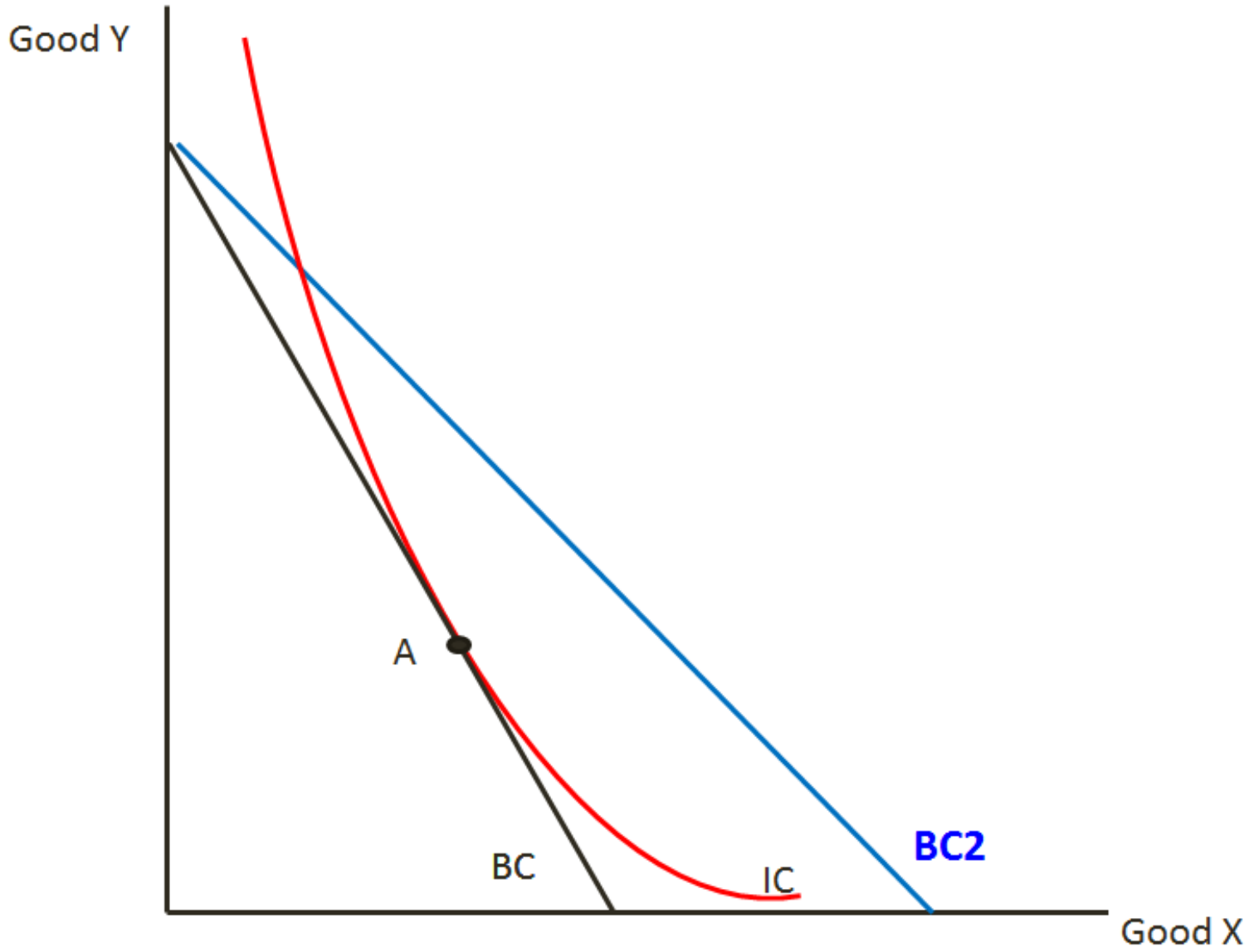


A to B is on the same indifference curve, telling us the substitution effect

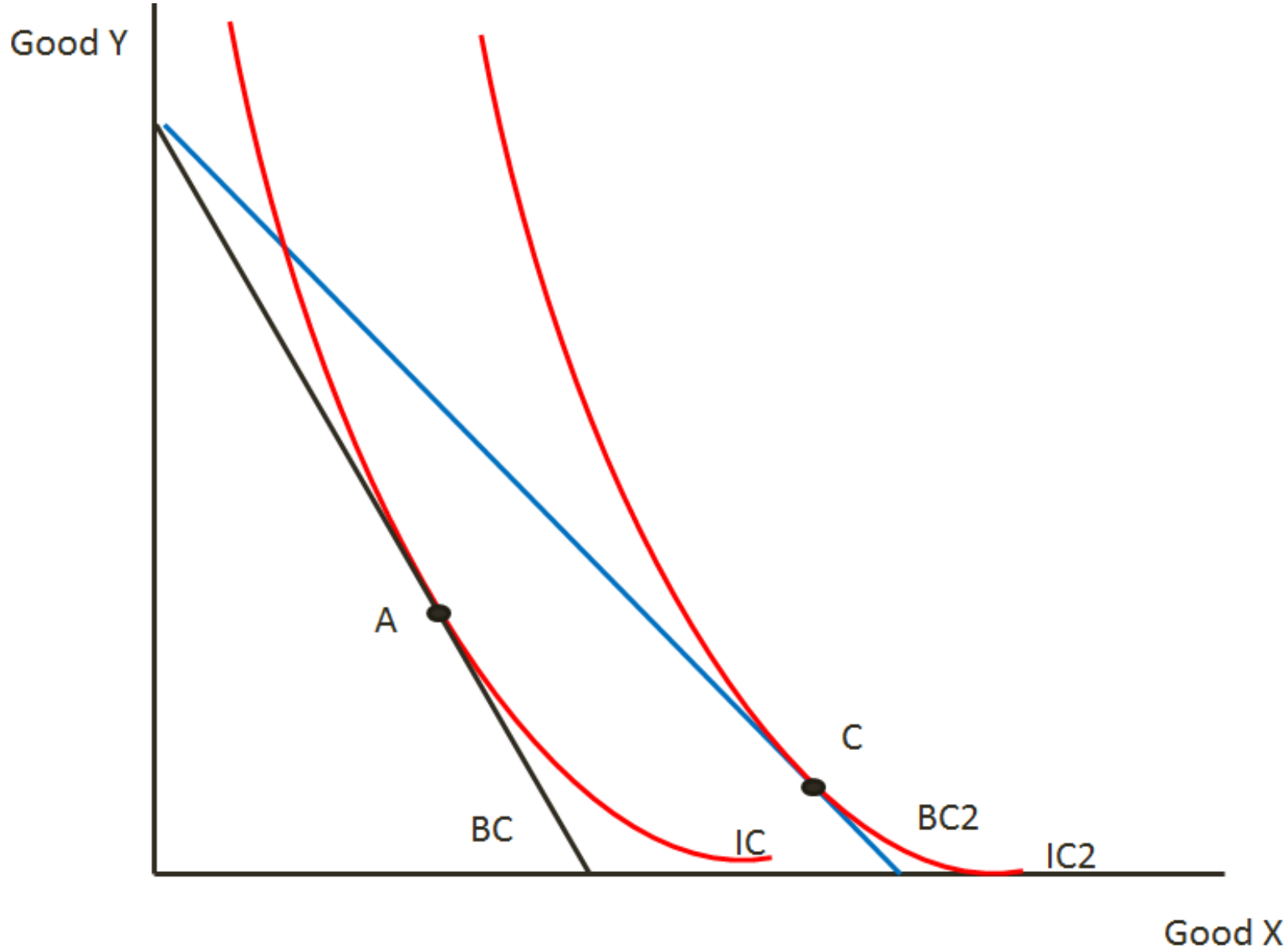
B to C are on parallel budget constraints, meaning same prices but different income (income effect)

Total effect: A to C

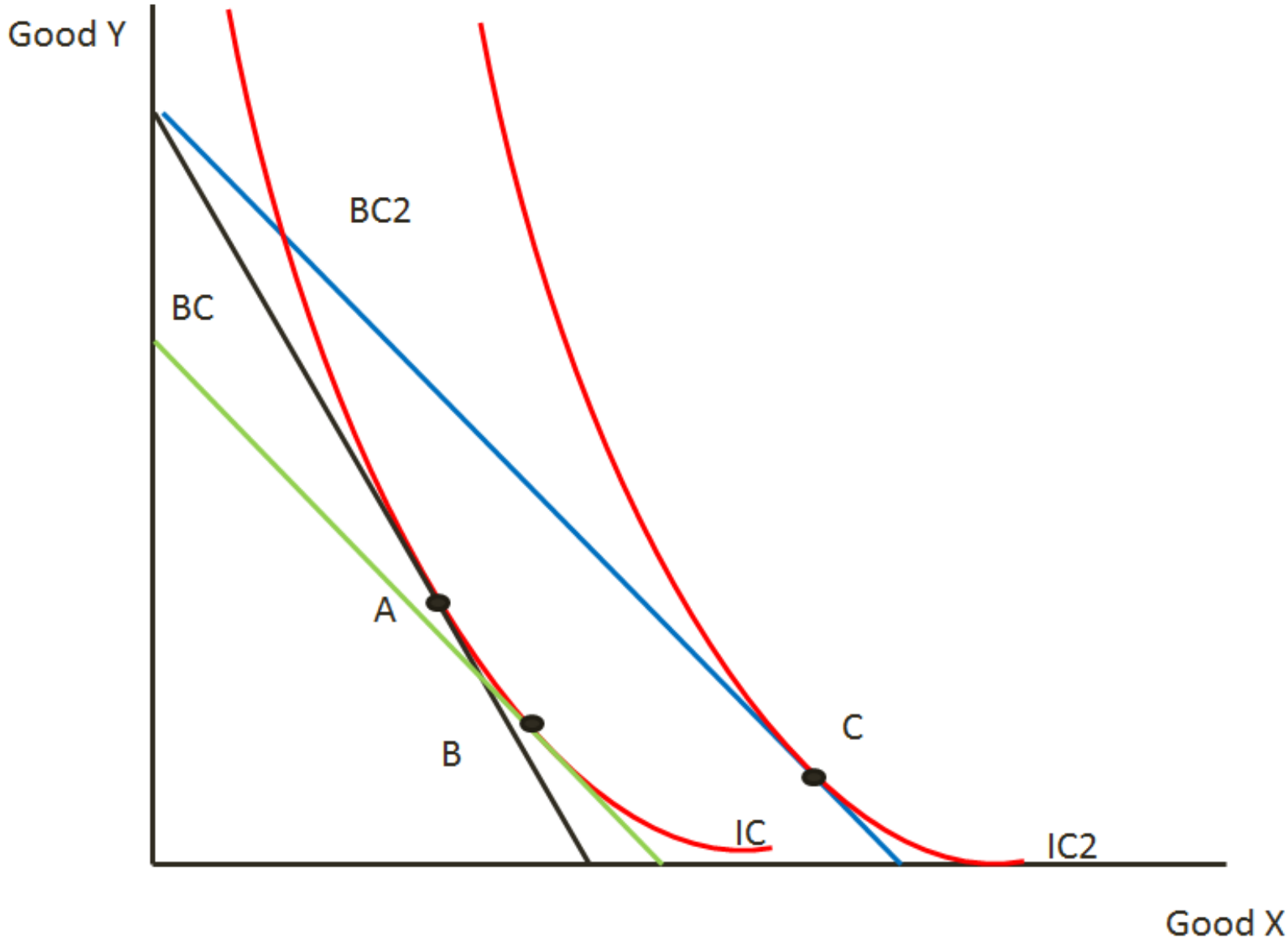
Example 2: price of good x decreases (new BC)



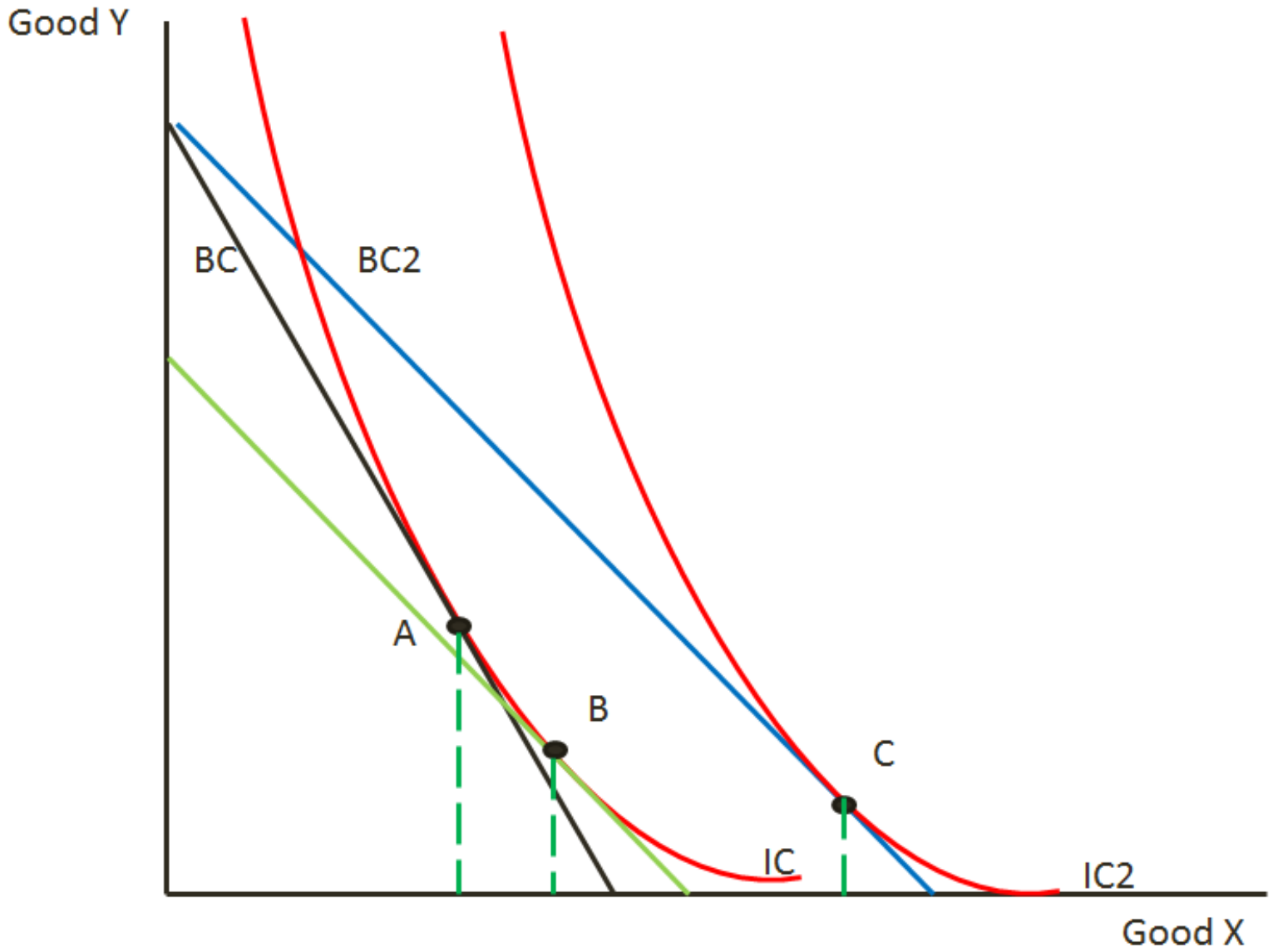
Ex 2: price of good x decreases (new OCB)



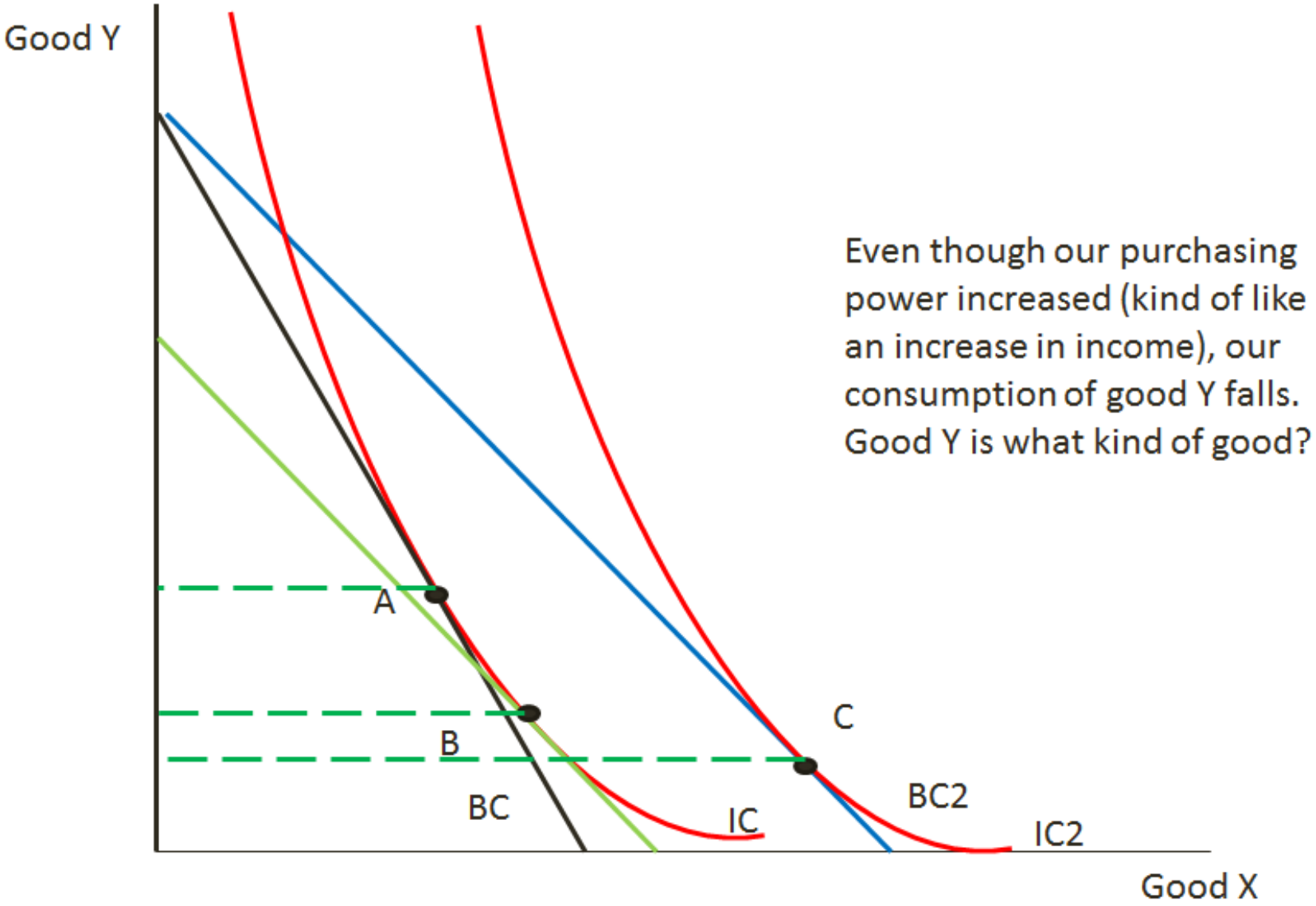
Ex 2: p(x) decreases (drawing parallel line - old IC)



Ex 2: p(x) increases IE, SE TE



Ex 2: p(x) increases what about good y?



Even though our purchasing power increased (kind of like an increase in income), our consumption of good Y falls. Good Y is what kind of good?

Application: Labor supply

- One important application of the theory of income and substitution effects is: **Labor supply**
- For consumer goods, price goes up, result in a **decrease** in income. So for normal goods, the **substitution** effect and **income** effect go the same way:
  - $\uparrow$Price $\Rightarrow$ $\downarrow$income
  - SE: $\uparrow$Price $\Rightarrow$ $\downarrow$quantity
  - IE (normal good): $\downarrow$income $\Rightarrow\downarrow$quantity
- For labor, price goes up (i.e. wage goes up), individual gets an **increase** in income.
  - Let's analyze IE and SE

Application: Labor supply

Suppose wage (price of labor) goes up

Income Effect

- We love leisure: the tradeoff is work or enjoy leisure
  - when analyzing labor supply (how many hours I work) need to consider leisure
- Leisure is a normal good:
  - we want more free time with the money we have so we can spend it.
- So income effect is telling us:
  - our income is increasing with wage
  - by IE consume more leisure and **work less**

Application: Labor supply

Suppose wage (price of labor) goes up

1. **Income Effect:** work less

2. **Substitution Effect:**
   - Leisure: a good. Has an opportunity cost: wage
   - When wages go up SE:
     - Opportunity cost of leisure increases
     - by SE when ↑OC: ⇒ consume less leisure **(work more)**

What is net effect?

- Over time, as income has increased time spent working has gone down
- So for trend over time, income effect has predominated

Application 2 (more examples)

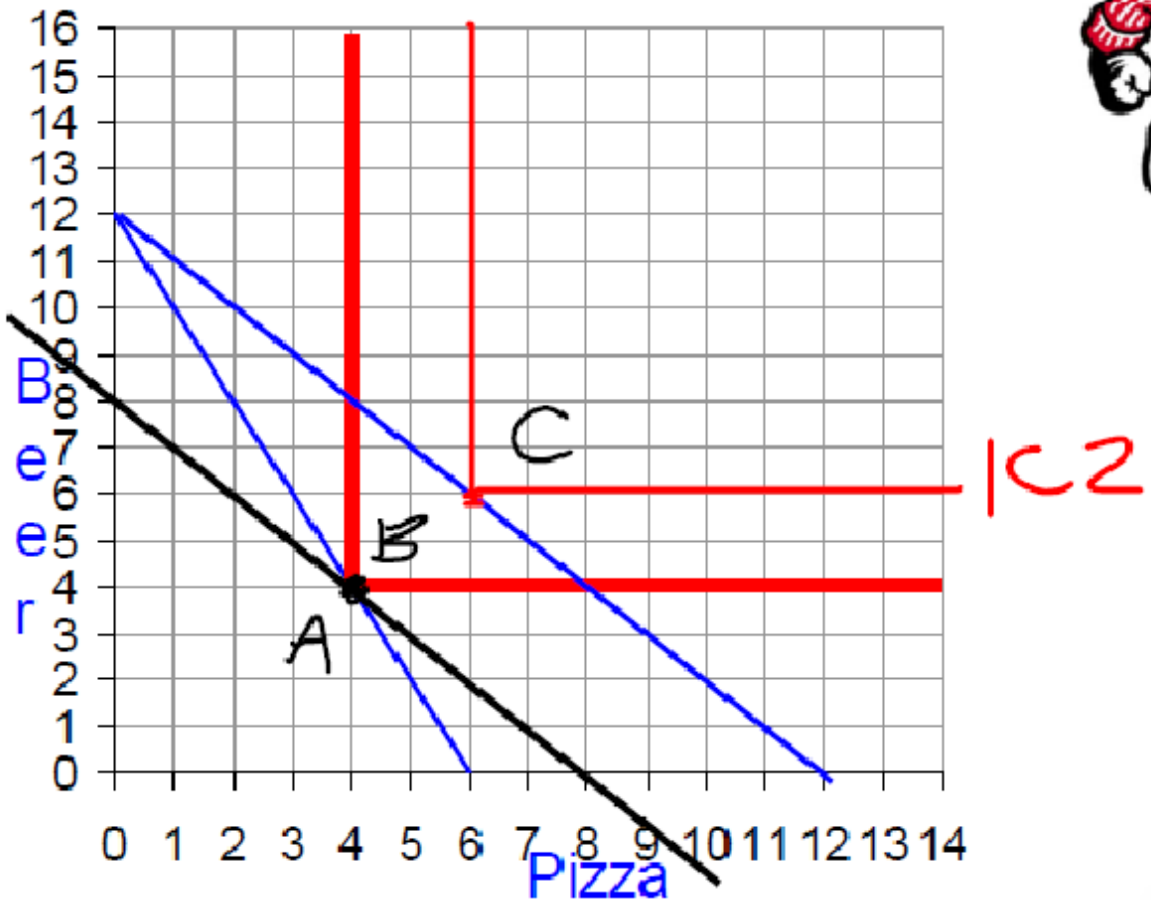
Let's test your knowledge of the substitution effect by figuring out what it will be for Bucky who consumes in fixed proportions.

Suppose price of pizza falls to \$2 (income still is \$24 and P^{beer} still \$2)

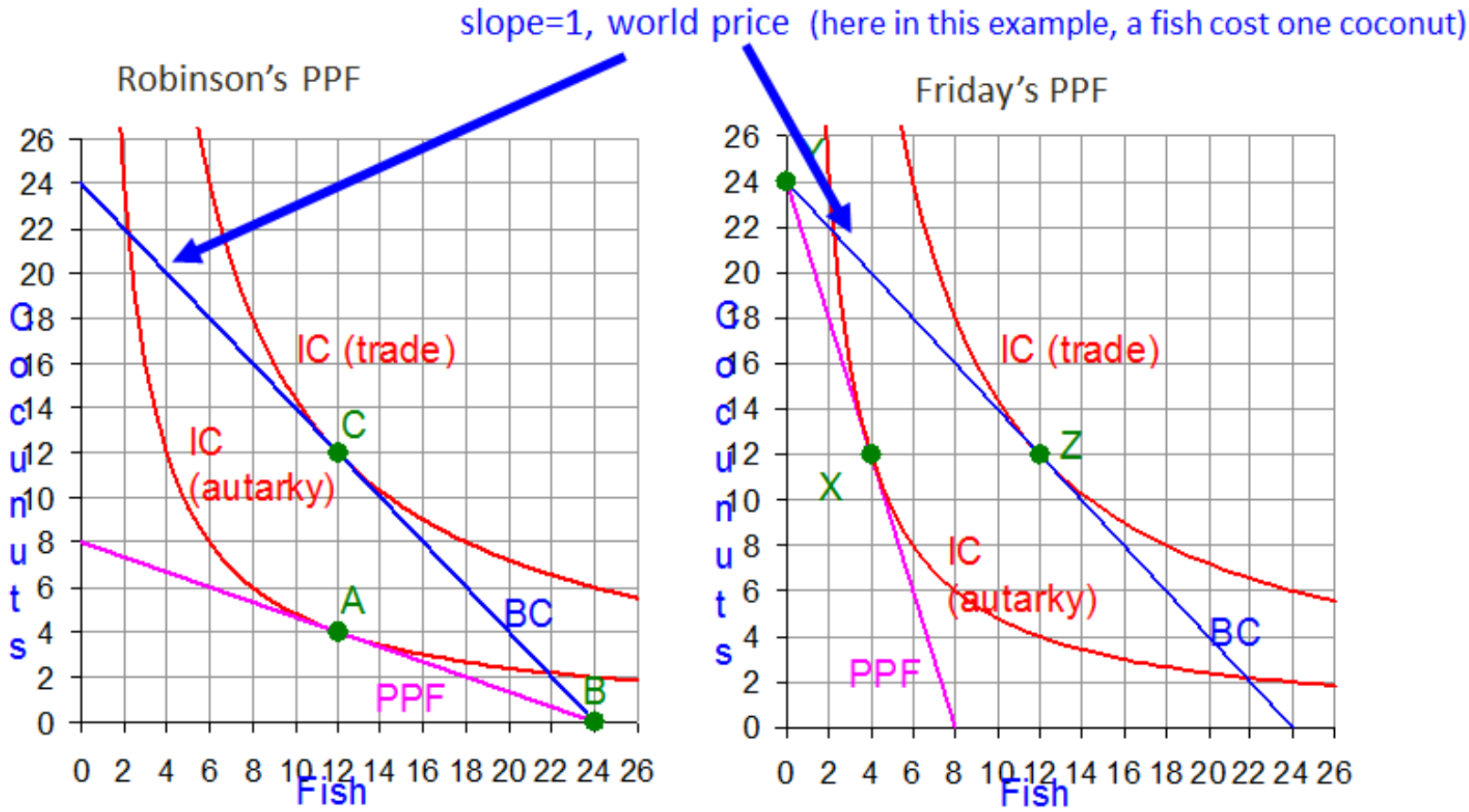
Fixed proportions (draw BC, new OCB, parallel line)

Let's test your knowledge of the substitution effect by figuring out what it will be for Bucky who consumes in fixed proportions.

Suppose price of pizza falls to \$2 (income still is \$24 and P^{beer} still \$2)



Application 3: Comparative advantage as a basis for trade



	Produce	Consume
Autarky	A(12F,4C)	A (12F,4C)
Trade	B(24F,0C)	C(12F,12C)

	Produce	Consume
Autarky	X(4F,12C)	X(4F,12C)
Trade	Y(0F,24C)	Z(12F,12C)

Comparative advantage as a basis for trade

Lots of great stuff on the previous graph!!!!

1. Production Possibility Frontier
2. Choice under autarky (on budget constraint where MRS equals opportunity cost)
3. Specializing in terms of comparative advantage
4. Gains from trade
5. Supply=Demand (Robinson supplies 12 fish and Friday demands 12 fish)