The utility maximizing bundle

draft Nov 1, 2011

Continue to consume two goods. Let's make it food and sports equipment, f and s where f if the amount of food purchased and consumed and s is the amount of sports equipment purchased and used.

1 Reviewing:

1.1 (1) Wanda Sue's indifference map is a complete representation of her preferences.

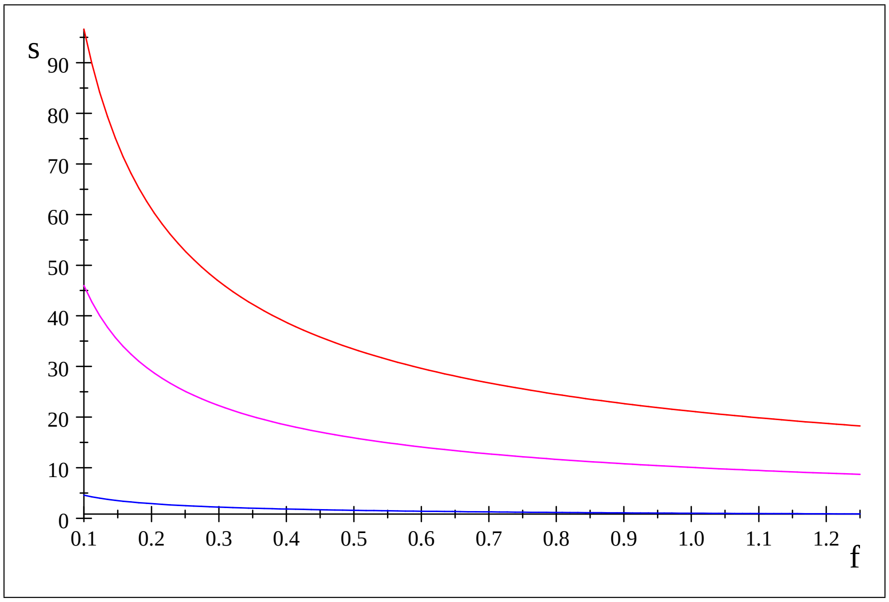
Since there are only two commodities her indifference map has only two dimensions.

For example, assume Wanda's utility function is $u = s^{.3} f^{.2}$

I want to show the Wanda's indifference curves
the math, in detail
Solving $u = s^{.3} f^{.2}$ for s the indfference curve is $s = u^{\frac{1}{.3}} f^{\frac{-.2}{.3}} = \frac{1}{f^{0.66}} u^{3.33}$

So the indifference curve for $u = 1$ is $\frac{1}{f^{0.66}}(1)^{3.33} = \frac{1.0}{f^{0.66}}$,
So the indifference curve for $u = 2$ is $\frac{1}{f^{0.66}}(2)^{3.33} : \frac{10.056}{f^{0.66}}$

So the indifference curve for $u = 2.5$ is $\frac{1}{f^{0.66}}(2.5)^{3.33} : \frac{21.142}{f^{0.66}}$



Wanda's indifference map

Wanda wants to get to the highest possible indifference curve.

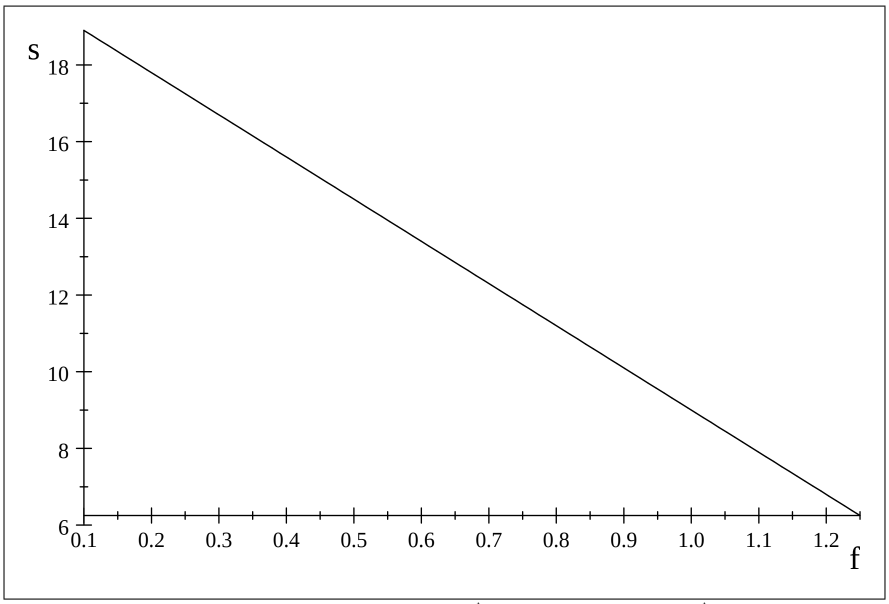
Given her current consumption bundle, the slope of her indifference curve, in absolute terms, is her marginal rate of substitution of food for sports equipment. $\frac{\triangle s}{\triangle f}\mid_{\triangle u=0}$ is the slope of the indifference and $-\frac{\triangle s}{\triangle f}\mid_{\triangle u=0}$ is the MRS_{fs}.

Her MRS_{fs} is the rate at which she is willing to give up sports equipment to get more food: her *wtp* for food in terms of sports equipment.

1.2 (2) Wanda is constrained by her budget constrant; she cannot consume a bundle (combination of f and s) that she cannot afford.

$m = p_f f + p_s s$ implying $s = \frac{m}{p_s} - \frac{p_f}{p_s} f$

Assme Wanda's income is \$100, that $p_s = \$5$ and that $p_f = \$55$
In which case, Wanda's budget line is $s = \frac{100}{5} - \frac{55}{5} f = 20.0 - 11.0f$



Wanda's budget set: $m = \$100, p_f = 55, p_s = \$5$

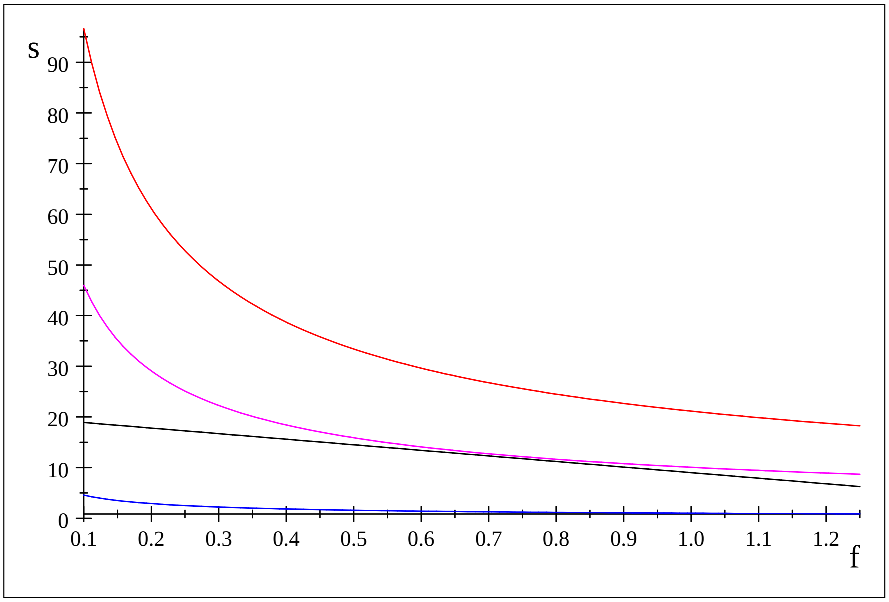
Along the budget line she is exhausting her income, and the slope of the budget line, $-\frac{p_f}{p_s} = -\frac{55}{5} = -11$ is the rate at which the market allows her to substitute food for sports equipment: how much sports equipment she will have to give up to get one more unit of food, $\frac{\triangle s}{\triangle f} |_{\triangle m=0}$

So, the slope of the budget line is the **rate at which the market allows** Wanda to substitute food for sports equipment. And, the slope of her indifferent curve is the rate at which she is **willing,** based on her preferences, to substitute food for sports equipment.

Keep in mind the difference between $\frac{\triangle s}{\triangle f} |_{\triangle m=0}$ and $\frac{\triangle s}{\triangle f} |_{\triangle u=0}$

2 Representing both preferences and the budget constraint

Putting Wanda's indifference map and constraint set on the same graph, Assuming no other constraints, Wanda's choice problem is fully represented

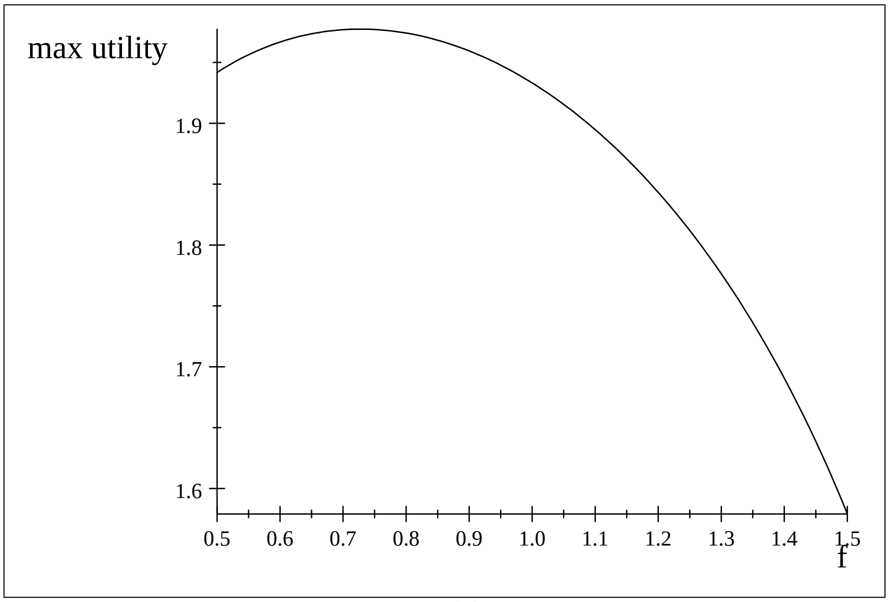


Wanda's choice problem

What bundle will Wanda choose to consume given her preferences and constraints? She want to get to the highest indifference curve she can afford.

It looks like approximately .75 units of food and

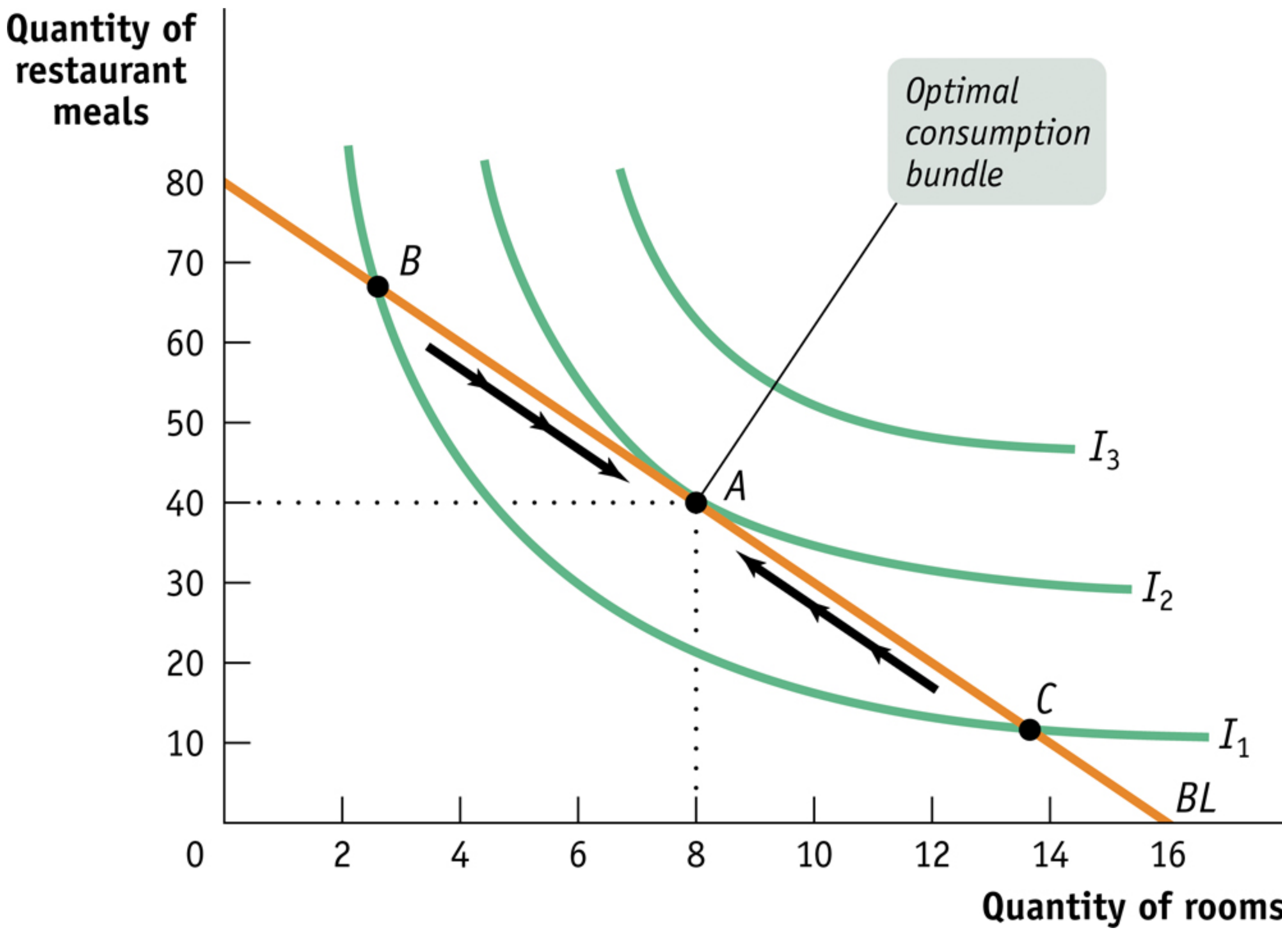
$20.0 - 11.0(.75) = 11.75$ pieces of sports equipment.



Max uility in term of food consumption

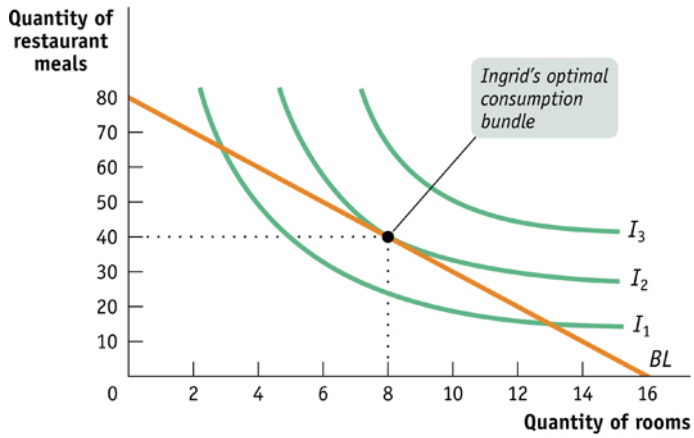
Her optimal bundle is how much f and s will will **demand** (purchase) in the market place. In this example .75 units of food and 11.75 of s.e.

KW has

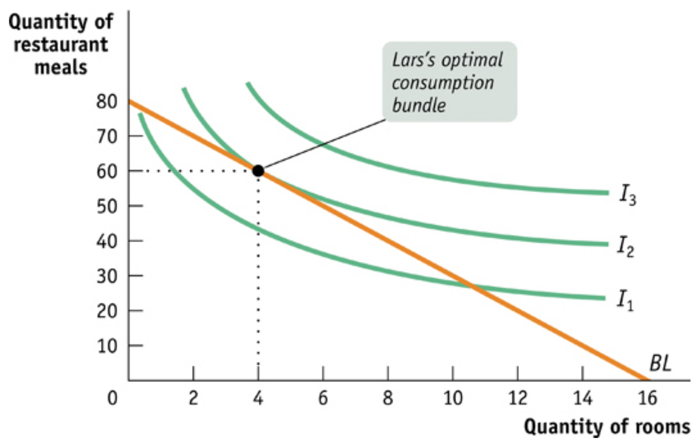


Note how having the same budget contraint, but different preferences leads to a different optimal bundles for Lars and Ingrid

(a) Ingrid's Preferences and Her Optimal Consumption Bundle

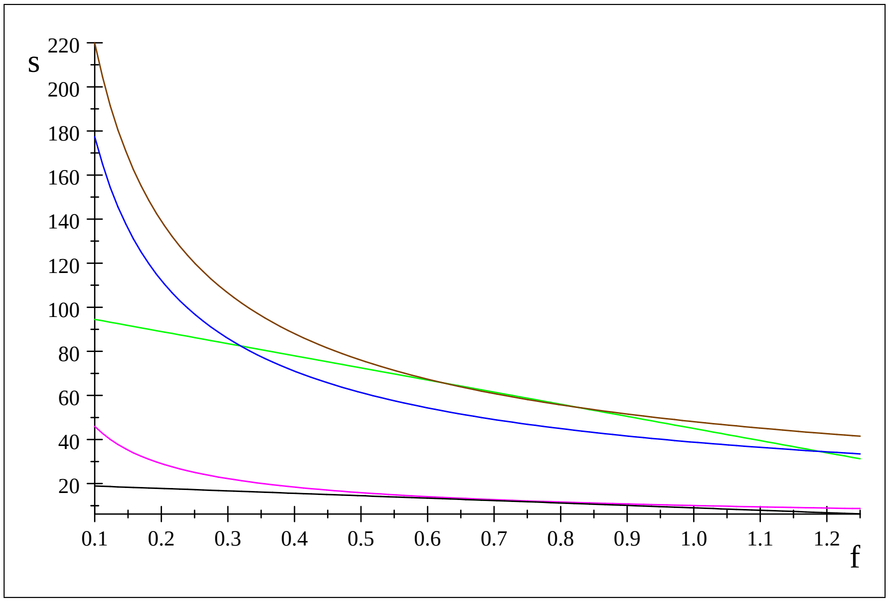


(b) Lars's Preferences and His Optimal Consumption Bundle



The next objective is to use our preference and constraint map to see how Wanda's choice changes when her constraints change.

Consider our previous graph

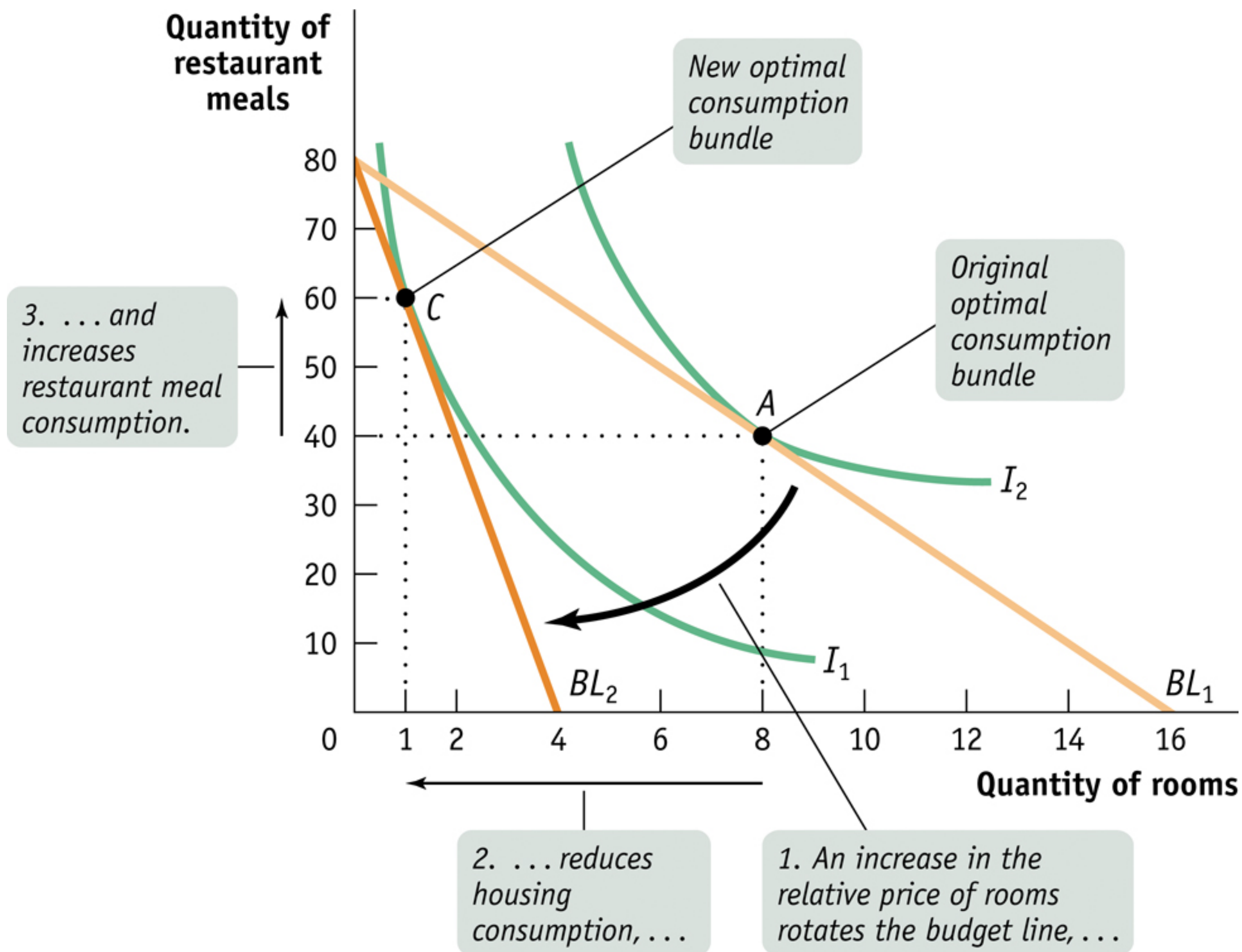


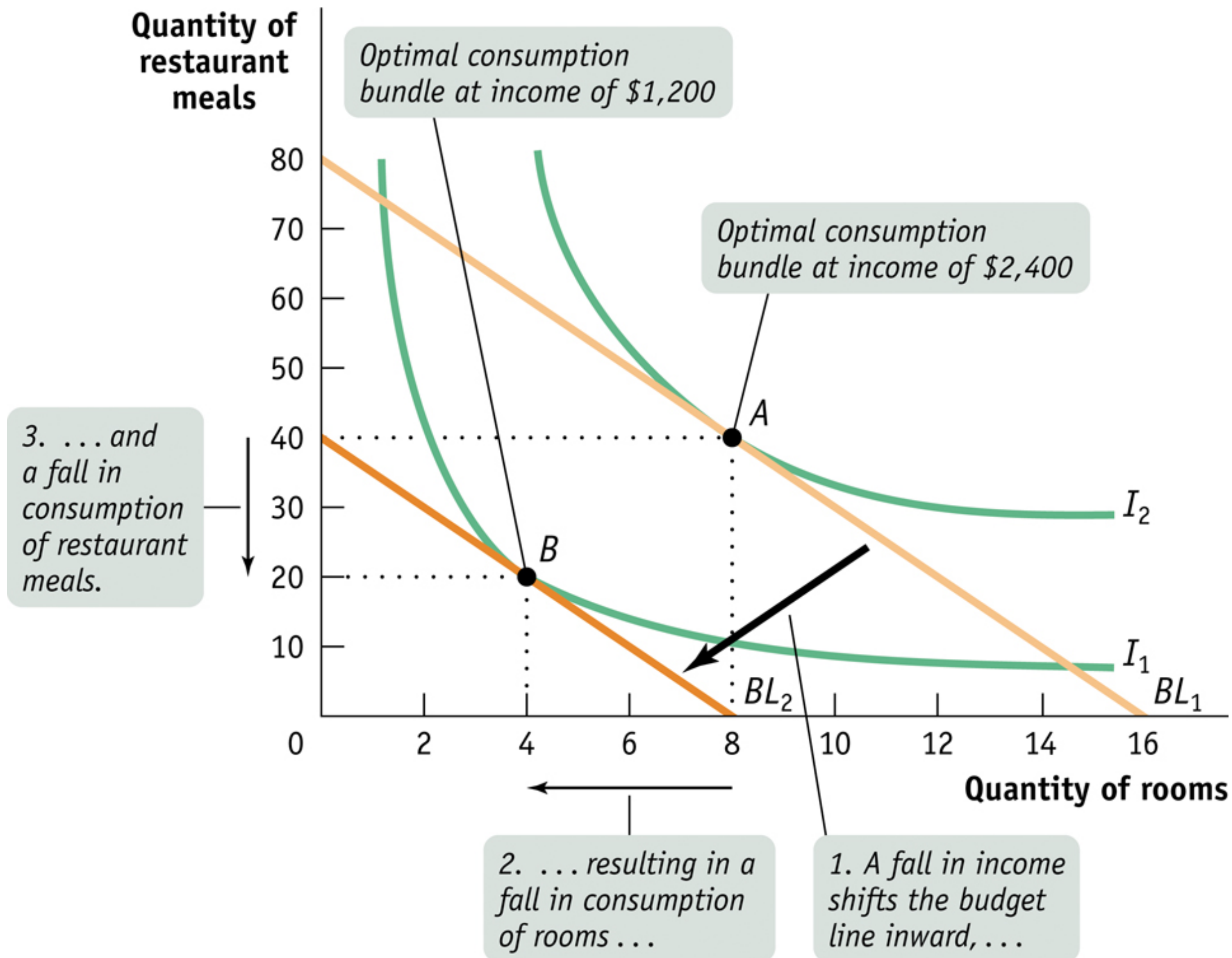
Wanda's choice problem with 2 diff contraints

where the black line is Wanda's orignal budget contraint and the green line is her constraint after the price of sports equipment has fallen from \$5 to \$1. Wanda's new budget constraint is $s = \frac{100}{1} - \frac{55}{1}f = 100 - 55f$, in green

Because of the price decrease, Wanda consumes a lot more sports equipment and a little less food.

Let's looks of some of the comparable graphs in KW




Quantity of restaurant meals
Optimal consumption bundle at income of $1,200
Optimal consumption bundle at income of $2,400
80
70
60
50
40
30
20
10
0
A
B
3. . . . and a fall in consumption of restaurant meals.
I_2
I_1
BL_2
BL_1
2
4
6
8
10
12
14
16
Quantity of rooms
2. . . . resulting in a fall in consumption of rooms . . .
1. A fall in income shifts the budget line inward, . . .

Income and substitution effects.