LECTURE 16

14 March 2013

ANNOUNCEMENTS

- HW 6 due tomorrow night
- Spring Break! No class next week.

FINANCING PUBLIC GOODS

- Who would pay for the $20 good in the free market?
  - D1 has the highest valuation at $9, but it is still not enough to cover the cost of $20 so no firm would supply the product
  - There is a **free-rider problem**: why pay for defense when you can enjoy the benefits waiting for someone else to pay
  - The problem here causes no good to be produced
- Government can save the day again by forcing us to pay
  - A tax on D1-D4 of $5 each could finance the project
  - It would also be Pareto improving (check that no one is worse off) after the tax and implementation of the defense program

OTHER METHODS

- A common example of a public good is a public lighthouse
- Lighthouses in the UK (this point is actually contentious) were privatized by introducing ways to **exclude** the product
  - Ships want the lighthouse to find way to a berth in a harbor
  - Lighthouse owners can charge the ships to use the berth
- Defense is harder to privatize (but we have), but what about excluding TV through cable, pay-per-view, etc.
- New technologies can make previously nonexcludable goods excludable (or vice-versa, like the news)
- Or maybe firms **invest** in these technologies to make the good excludable with hope to make profit (better make sure they IP protection on those investments)

CHINA AND THE OLYMPICS PUBLIC GOOD

- Relative to a country, like Greece, China is relatively poor per capita
- But they spent, without financial devastation, an enormous amount of money on the 2008 Olympics, 2010 Shanghai Expo, Greece went bust in 2004 with the Olympics, why?
- China is huge and investment in Olympic village, Beijing airport, etc. were investments in **public goods** that can be spread in many more directions than relatively small Greece can

COMMON POOL RESOURCES

- There are two types of goods remaining:
  - **Excludable, nonrival** - "club goods" such as country clubs, satellite TV
  - **Nonexcludable, rival** - **common pool resources**
- Famous example is world stock of fish in international waters
  - Cannot limit fisherman access to these waters
  - Overfishing, though, devastates local fish population and depletes the resource

TRAGEDY OF THE COMMONS

- Imagine now a common pool resource - a pasture shared by farms for cows to graze on
  - Everyone sends their cows to the grass but no one cares for it
  - Eventually the grass is depleted
- This depletion issue with common pool resources is known as the **tragedy of the commons**
- Until recently air, water were viewed as **public goods**
- More recent research is treating clean air and clean water as common pool resources; enough pollution can deplete our stock of clean air and water

GOODS MATRIX

	Rival	Nonrival
Excludable	**Private Good** - Coach bags, MacBooks, pie	**Club Good** - country clubs, parks
Nonexcludable	**Common Pool Resource** - fish stocks, clean air	**Public Goods** - defense, highways

SUMMARY

- Excludability refers to the ability to limit people from consuming a good
- Rivalry refers to the characteristic of a good that my consumption prevents someone else's consumption of the good
- In general the free market typically under-provides or does not provide public goods, government (and occasionally) private solutions can ensure public goods are provided when efficient
- The tragedy of the commons refers to the depletion of common pool resources, such as fisheries, because consumers do not limit their consumption of the good or care for the upkeep of the resource

TOPIC 12

Consumer Theory

BIG PICTURE

- How do tastes and budget issues together factor into a consumer's purchase decisions?
- What is a utility function and indifference curve?
- What conditions are satisfied for a consumer's best consumption option?
- What are income and substitution effects and what do they tell us about the effect of price on optimal consumption?

UTILITY MAXIMIZATION AND DEMAND

Utility Maximizing Dog

CONSUMER THEORY

- In MacLand we made no comment on why D1-D10 liked MacBooks as they did (why is D1's valuation $9)
- We also did not allow people to consume more than one unit
- **Consumer theory** focuses in part on how consumers make their consumption decisions (how do you make your decisions?)
- Consumer theory in economics largely boils down to:

1. **Tastes** (what do I want to consume?)
2. **Budget constraints** (how much / what can I afford to consume?)

DONALD THE CONSUMER

- Donald mostly likes to consume cheese and wine
- We are interested in Donald's **demand**
- **Demand** for a single consumer tell us how much of the products (wine and cheese) he wants **as a function of income and prices**
  - So how will demand change as prices change?
  - How will demand change with income?

BUDGET CONSTRAINT

- Donald has fallen on hard times lately so is looking for discount cheese and wine
- His income $I = \$24$
- Price of cheese is $P_{cheese} = \$4$ / wheel
- Price of wine is $P_{wine} = \$2$ / bottle
- If Donald spends ALL his money, how much of each can he afford?

Cheese	Wine
0	12
1	10
2	8
3	6
4	4
5	2
6	0

BUDGET CONSTRAINT

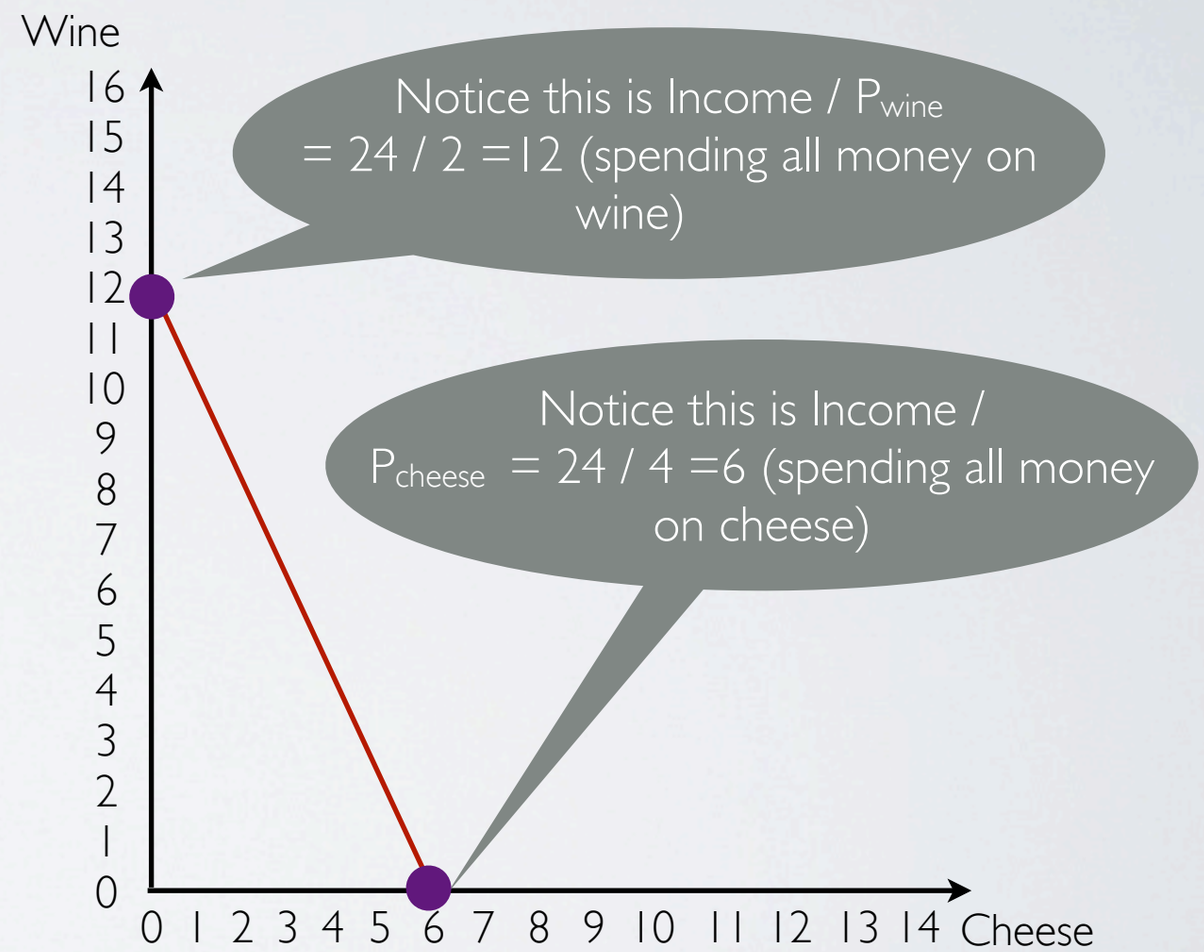
- This is precisely the budget constraint
- **Budget constraint** tells us what is the MOST I could consume of the goods (so I must be using all of my money)
- The constraint here is depicted as different **consumption plans**

Cheese	Wine
0	12
1	10
2	8
3	6
4	4
5	2
6	0

BUDGET CONSTRAINT

- We can depict the budget constraint graphically
- If Donald spends all of his money on wine, how much can we consume? On cheese?
  - 12 bottles of wine
  - 6 cheese wheels
- Like a PPF, these extreme values (only consuming one are the other) are all we need to draw the constraint

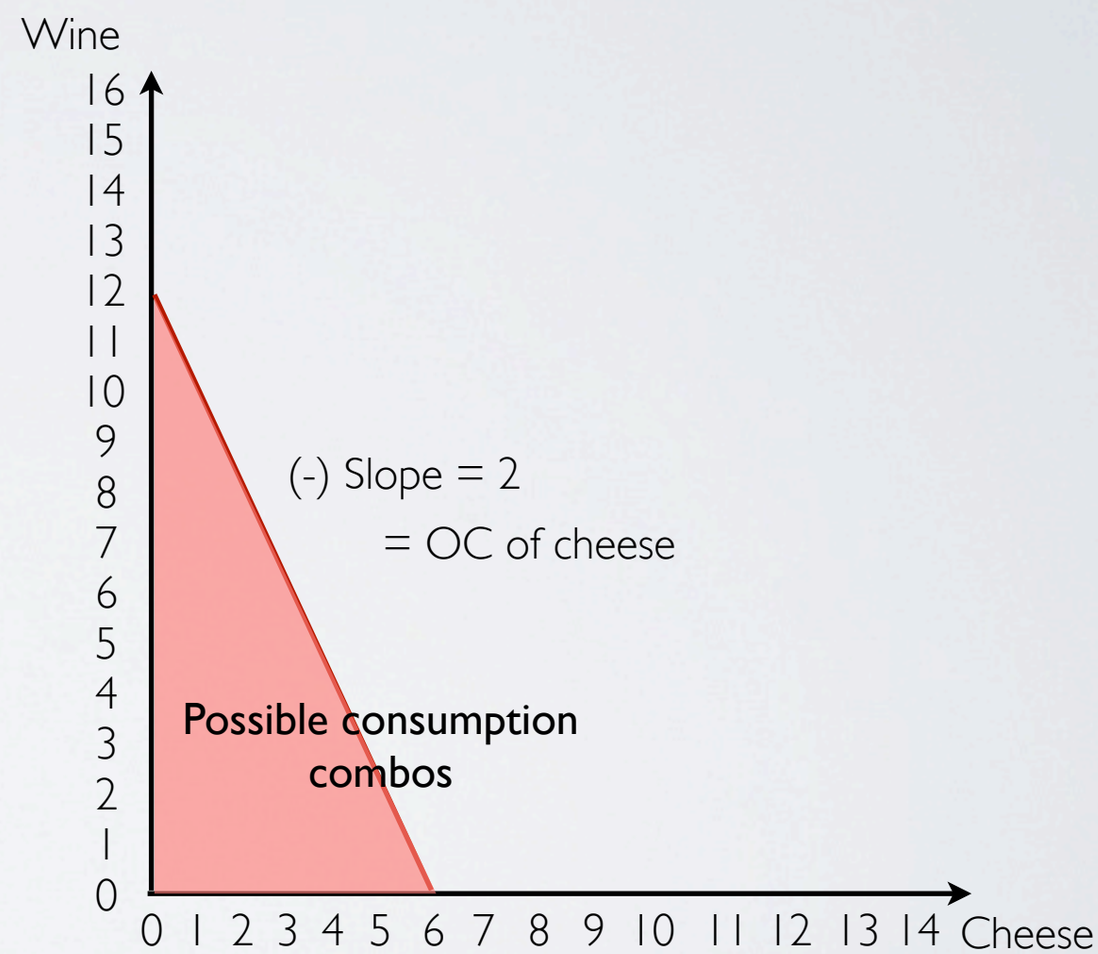
Donald's Budget Constraint



INTERPRETING THE CONSTRAINT

- What is the (negative) slope of the line and what does it represent?
  - Slope is 2
  - The slope is the **opportunity cost of buying cheese**
- This is just like the production possibilities frontier!!
- Except now:
  1. Consumption plans instead of production
  2. Our limited resource is income not time
- **Anything below the constraint is a bundle of cheese and wine Donald can consume**

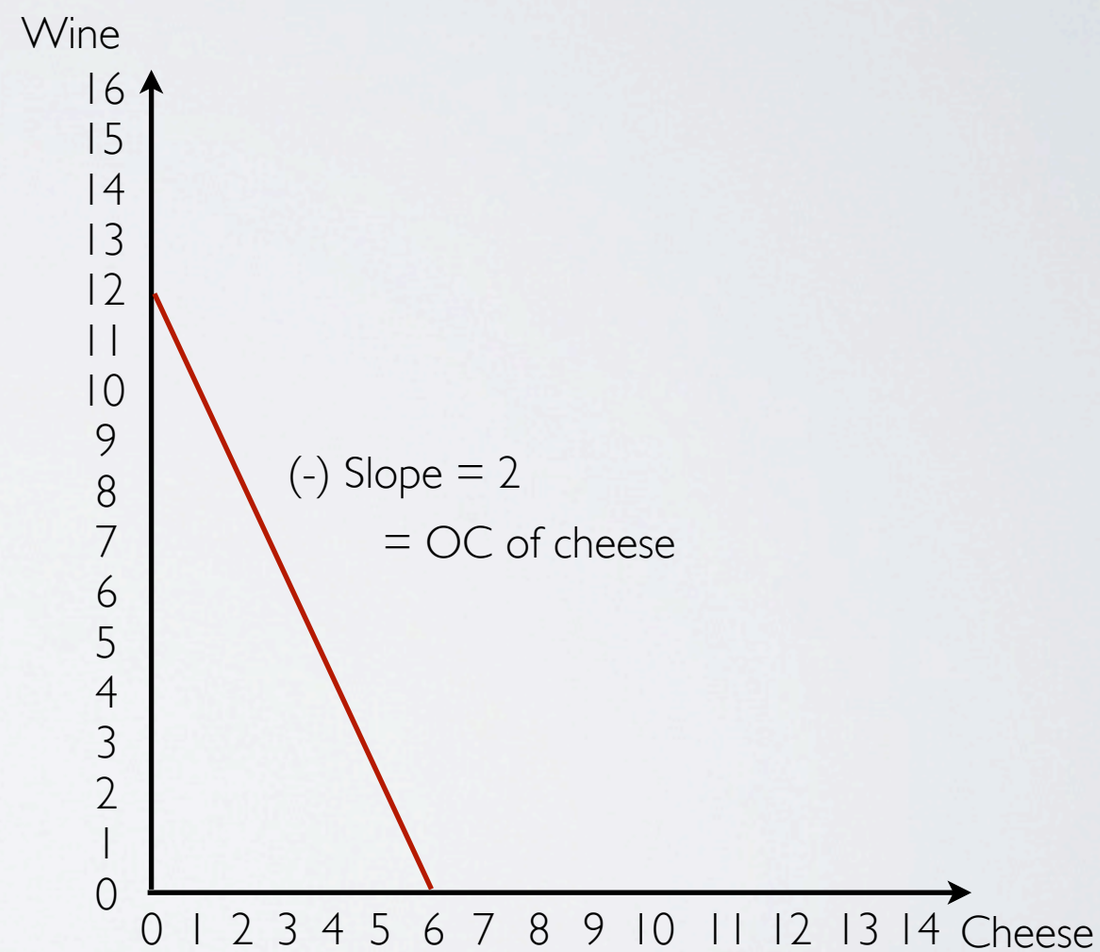
Donald's Budget Constraint



INTERPRETING THE CONSTRAINT

- So the opportunity cost of cheese in terms of wine is 2 bottles of wine
  - I have to give up buying two bottle of wine to get one more cheese wheel
  - What is OC of wine?
- Remember: reciprocal of slope gives OC of good on y-axis
  - So OC of wine in terms of cheese is 1/2 cheese wheels

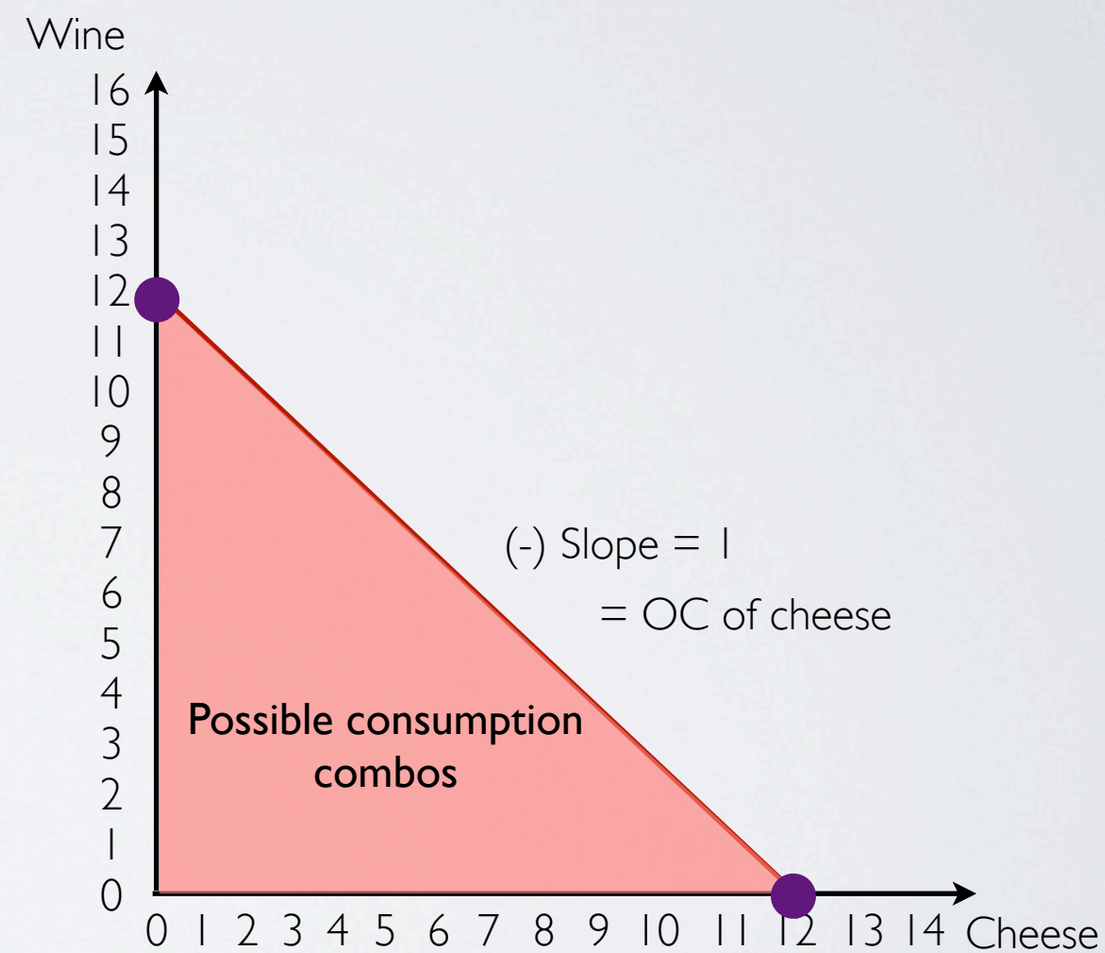
Donald's Budget Constraint



BC AND PRICE CHANGES

- If the price of cheese falls to $2 a wheel, how does the budget constraint change?
- Now Donald can afford to buy 12 cheese instead of 6 so budget constraint expands
- What is the OC of cheese now?
  - OC has fallen to one bottle of wine per cheese wheel
  - Makes sense that opportunity costs fall as the price of the product also falls (I don't have to give up as much wealth)

Donald's Budget Constraint



CONSUMER DESIRES

- The budget constraint is a limit on what we can consume
- We still don't know how much Donald wants to consume
  - This depends on taste of the consumer
  - For example, I would want be very, very happy with 10,000 Macs; most of you would prefer a more diversified mix of goods ....
- Economists study the **preferences** of a consumer
- **Preferences** are simply a consumer's ranking of potential consumption bundles (do you *prefer* 2 cheese and 1 wine to 2 cheese and 1 wine or 3 cheese to 3 wine, etc.)

UTILITY FUNCTIONS

- Preferences can be described by **utility functions** for convenience
  - A utility function turns different bundles into a number, **a utility,** e.g. utility of 3 wine and 1 cheese is 5 utils
  - **Utility** is a measure of how *happy* the consumer is with the bundle of goods
  - In reality, the number is meaningless, what matters is how the utility associated with bundle compares to the utility associated with another bundle
  - If you like 3 wine more than 3 cheese, the utils associated with three wine should be higher than the utils with 3 cheese
- **Optimal consumption** is the bundle of goods that you can afford that makes you happiest (maximizes utility)
- Economists generally **assume that people are utility maximizers**; is this a good assumption?

PLAYING WITH UTILITIES

- We are going to introduce some of Donald's friends:
  - Rich, former presidential candidate **Ross Perot**
  - Billionaire **Warren Buffett**
- They all have the same income as Donald ($24), face the same prices, but have *different* preferences
- How will their choices change based on preference differences alone?

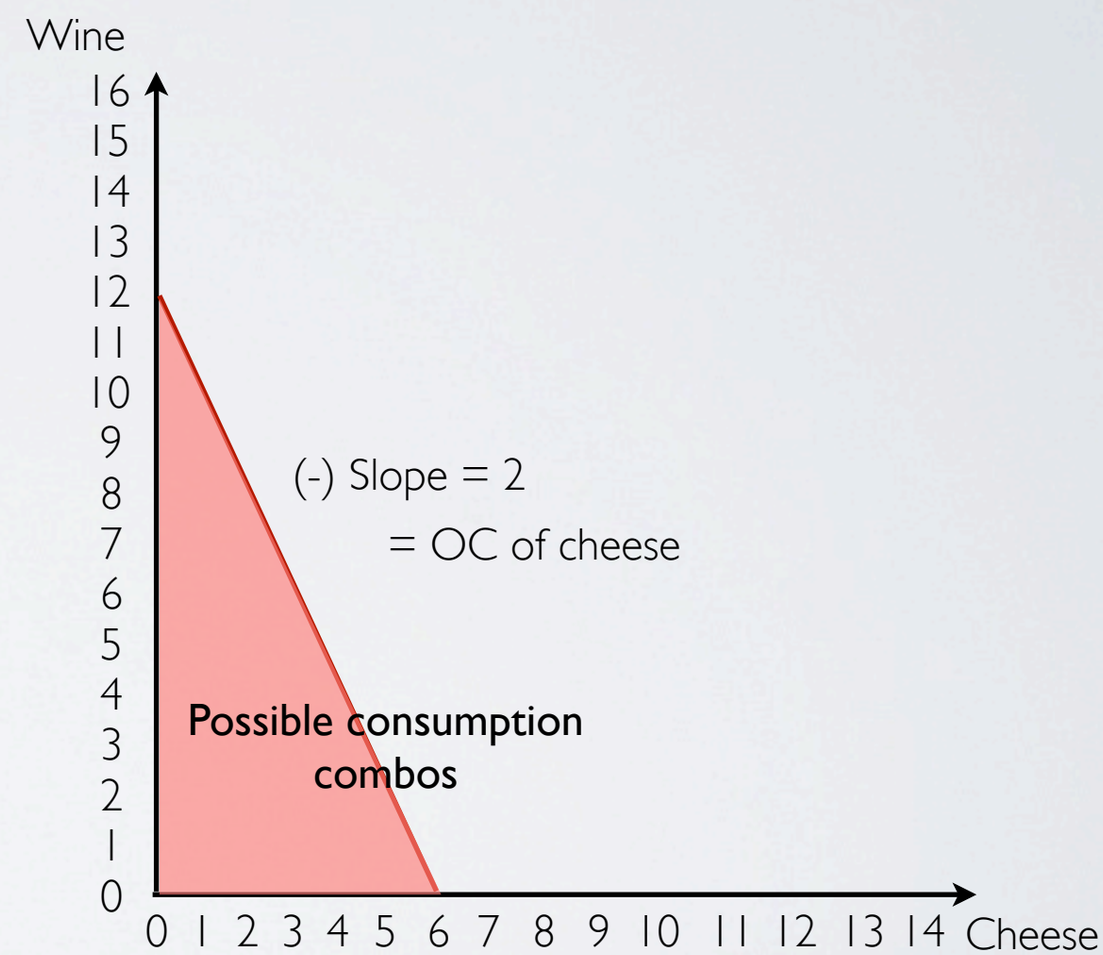
PERFECT SUBSTITUTES

- Ross Perot is not picky; he just wants to consume calories via wine and cheese
- Suppose for him calories = happiness and a wine bottle and cheese wheel both have 200 calories
- Ross's utility function is Utility = $200*Q_{Cheese} + 200*Q_{Wine}$
  - Do you see how this represents his philosophy that calories are all that matter?
- We are interested in what combo of cheese and wine maximizes utility

PERFECT SUBSTITUTES: BC

- Remember P_{Cheese} = \$4 and P_{Wine} = \$2 and Ross's income is \$24
- In this **special case**, though, we do not need the constraint; Ross will purchase whatever good gives him more utility per dollar spent
- If Utility = $200*Q_{Cheese} + 200*Q_{Wine}$, what is the utility / dollar for wine and cheese?
  - Ross gets 200 utils per unit of cheese and has to pay \$4 per unit so 50 utils / dollar on cheese
  - Likewise, 100 utils / dollar on wine

Ross's Budget Constraint



PERFECT SUBSTITUTES: OPTIMAL CONSUMPTION

- So cheese gives us 50 utils / dollar and wine 100 utils / dollar, what will Ross do to **maximize utility**?
  - Ross just wants more bang for his buck and utils are cheeper so he will only consume wine
- So his **optimal consumption** of wine and **optimal consumption** cheese are:
  - Wine is 12 bottles
  - 0 wheels of cheese
- With perfect substitutes, you consume only the good that gives you the highest utils / dollar