Module 5:

Demand Theory

Def: Competitive Market

- 1 good
- Many buyers
- Many sellers

Def: Demand

- Represents the behavior of buyers

Def: Demand Curve

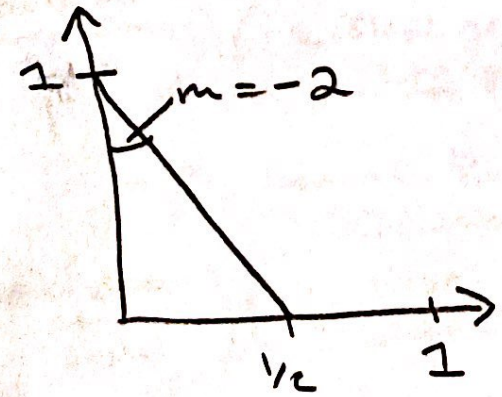
- Shows Quantity Demanded at various prices
- The Quantity that buyers are willing & able to purchase @ a particular price

Examples

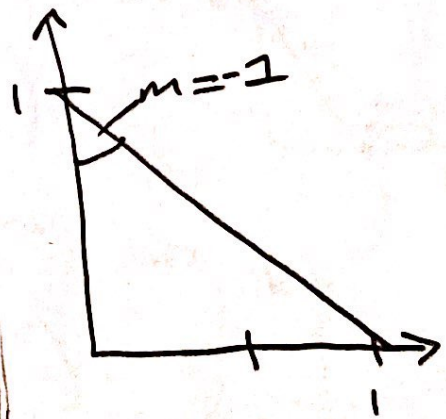
The Linear Demand Curve

Again $y = mx + b$ where $m \leq 0$ (always enters into function negatively)

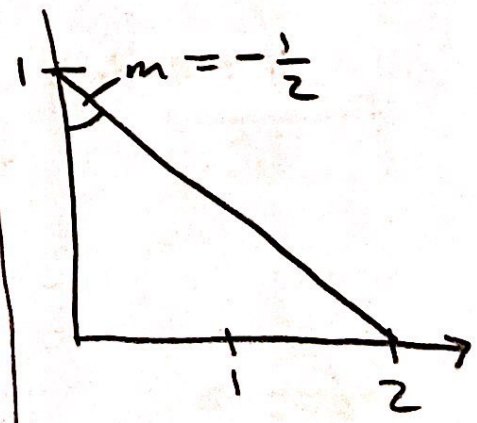
But now, $P = mx + b$



$(P = (-2)x + 1)$



$(P = (-1)x + 1)$



$(P = (-\frac{1}{2})x + 1)$

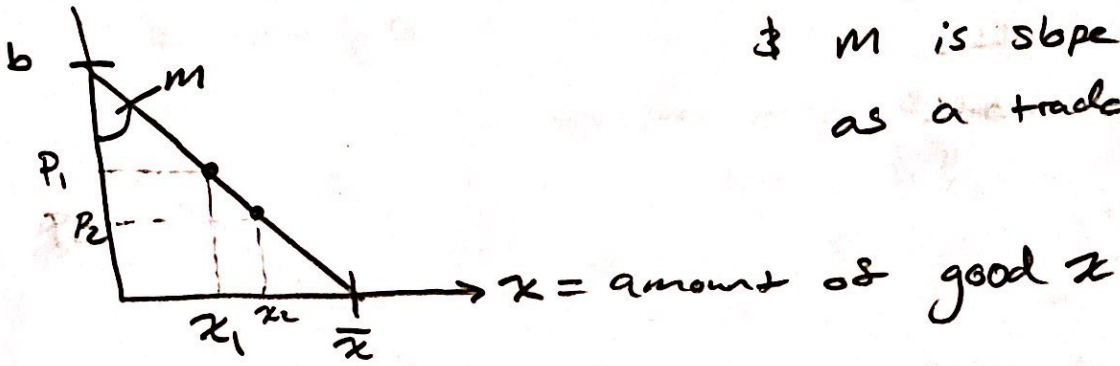
So, in general form we can represent a demand function as:

$$P = b - mx$$

where, b is the intercept, also known as the choke price.

& m is slope, also known as a trade off ratio.

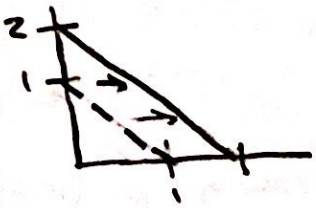
$\Rightarrow$ P = price of good x



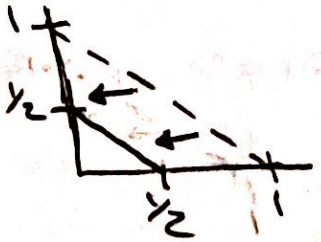
- b & m both control demand shifts

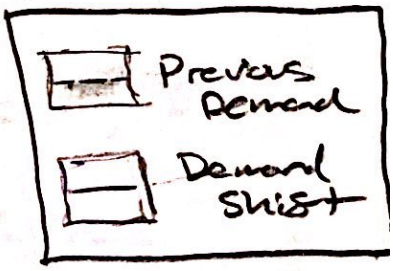
Changes in Demand

b ↑, Demand shifts out $\Rightarrow$



b ↓, Demand shifts in $\Rightarrow$

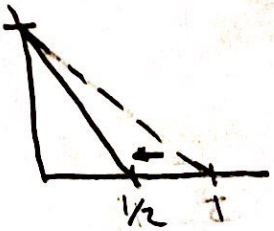




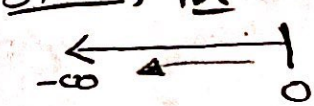
m ↓, Demand Rotates Inwards

(Gets further away from zero) (i.e. slope gets steeper)

$\Rightarrow$



Since m



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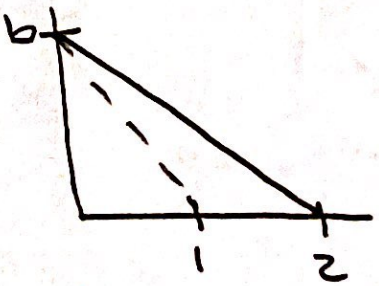
m ↑, Demand Rotates Outwards

(Gets closer to zero) (i.e. slope gets flatter)

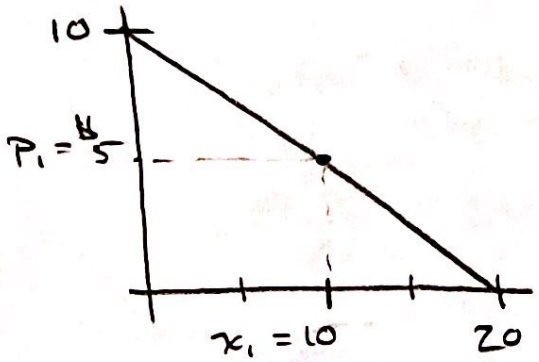
$\Rightarrow$



Slide 5: Notice that the demand curve is always decreasing. This is because as price falls, we can buy more (& vice versa).

Linear Demand Curve

Let, $P = 10 - \frac{1}{2}x$

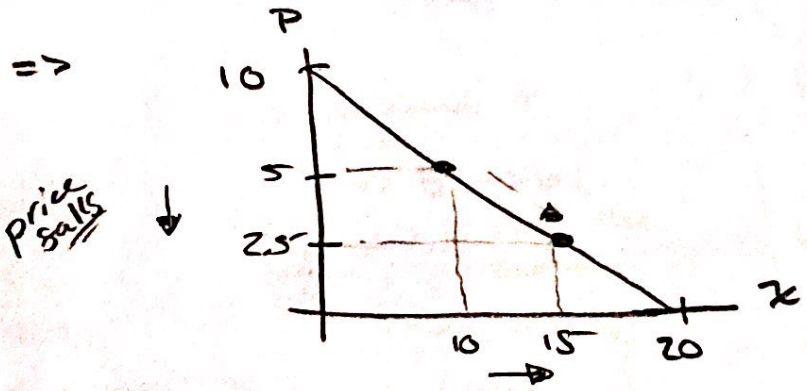
$\Rightarrow$ 

$\Rightarrow$ Can buy 10 units of good x for $\$5$.

$\Rightarrow m = -\frac{5}{10} = -\frac{1}{2} = -\frac{(1/2)}{1}$

$\Rightarrow$ If price falls by $1/2 (\$.50)$, consumers will demand one more unit

$\Rightarrow$ What happens when price falls?

$\Rightarrow$ 

$\Rightarrow$ Price moves from $\$5 \rightarrow \$2.50$

$\Rightarrow 2.5 = 10 - \frac{1}{2}x$

$\Rightarrow \frac{1}{2}x = 7.5$

$x^*_{new} = 2(7.5) = 15$

$\Rightarrow$ New bundle is $(15, 2.5)$ — x^*, p^*

$\Rightarrow$ Price per unit went from $\$.50 \longrightarrow \$0.167 \simeq \$0.17$

YAY!

Increase / Decrease in Demand (line shifts)

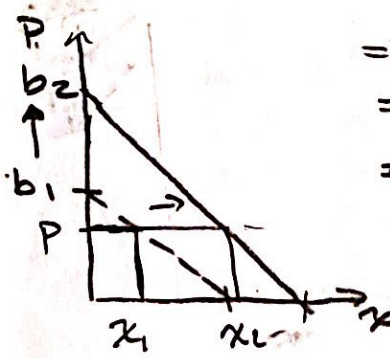
Example 1 - 1 good

$$P = b - mx$$

$\Rightarrow$ $b \uparrow$ (or) $m \uparrow$ (gets closer to zero), Demand Increases $\uparrow$

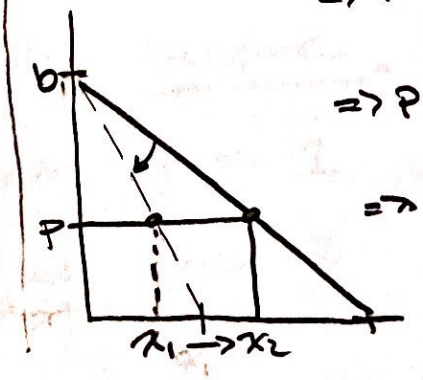
$\Rightarrow$

$\Rightarrow$ $b \uparrow \Rightarrow$ Demand $\uparrow$



$\Rightarrow$ From $b_1 \rightarrow b_2$,
$\Rightarrow$ price stays the same
$\Rightarrow$ $x_1 \rightarrow x_2$ where $x_1 < x_2$
$\Rightarrow$ Demand Increases

$m \uparrow \Rightarrow$ Demand $\uparrow$

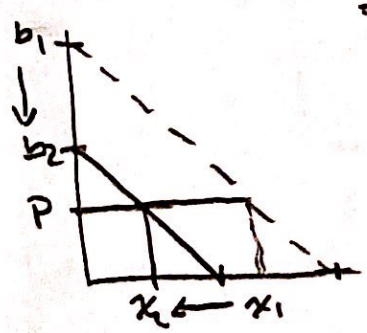


$\Rightarrow$ $m_1 \rightarrow m_2$ where $m_1 < m_2 \leq 0$
$\Rightarrow$ price stays the same
$\Rightarrow$ $x_1 \rightarrow x_2$ where $x_1 < x_2$
$\Rightarrow$ Demand Increases

$\Rightarrow$ $b \downarrow$ (or) $m \downarrow$ (gets more negative), Demand Decreases $\downarrow$

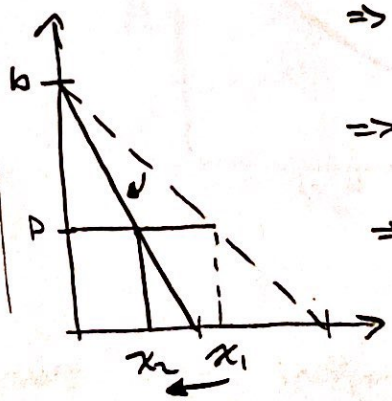
$\Rightarrow$

$b \downarrow \Rightarrow$ Demand $\downarrow$



$\Rightarrow$ $b_1 \rightarrow b_2$
$\Rightarrow$ P stays the same
$\Rightarrow$ $x_1 \rightarrow x_2$ where $x_2 < x_1$

$m \downarrow \Rightarrow$ Demand $\downarrow$



$\Rightarrow$ $m_1 \rightarrow m_2$ where $m_2 < m_1 \leq 0$
$\Rightarrow$ price stays the same
$\Rightarrow$ $x_1 \rightarrow x_2$ where $x_2 < x_1$

In Summary,

Changes in Parameter Values	Demand
$b \uparrow$ (or) $m \uparrow$ (gets closer to zero)	Increases $\uparrow$
$b \downarrow$ (or) $m \downarrow$ (gets closer to $-\infty$)	Decreases $\downarrow$

Example 2 – Cobb-Douglas Demand (2-goods)

Let the demand for goods 1 & goods 2 be

$$(x_1^*, x_2^*) = \left(\frac{\alpha}{(\alpha+\beta)} \frac{M}{P_1} , \frac{\beta}{(\alpha+\beta)} \frac{M}{P_2} \right)$$

α = The consumer's preference for good 1

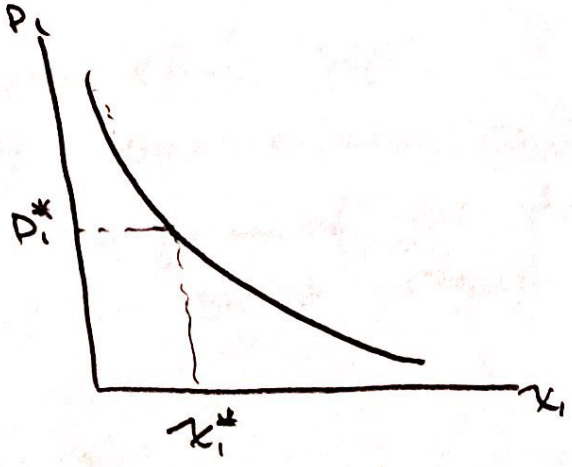
β = The consumer's preference for good 2

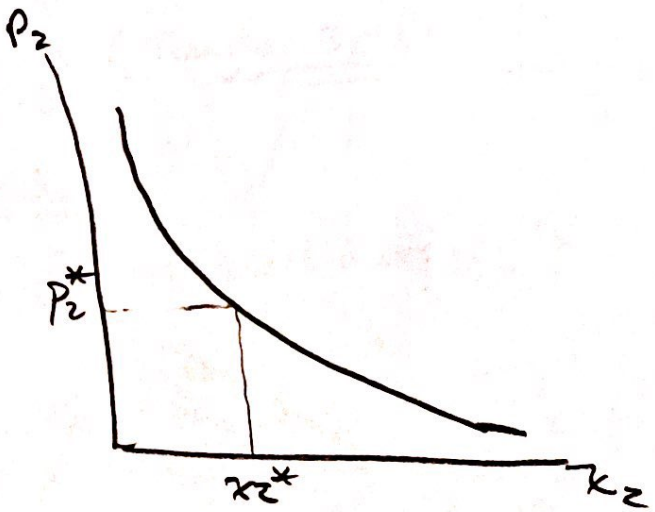
M = The consumer's income.

P_1 = The price of good 1

P_2 = The price of good 2

Shape of Curve





Where,

- Notice that these goods are independent in terms of price, but not preference.
- Normal goods because Demand increases when income (M) increases.

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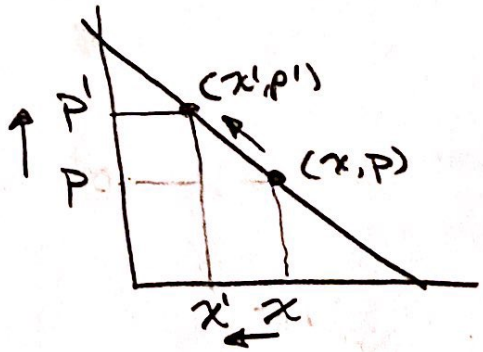
Learning By Doing: Question 2

a) Price of car tires increases



$\Rightarrow p \to p'$

$\Rightarrow x \to x'$ where

$p < p'$

$x > x'$

$\Rightarrow$ Decrease in Demand

b) Demand for Aluminum ↑

$\Rightarrow$ Price for Aluminum ↓

$\Rightarrow$ Cost less to produce cars

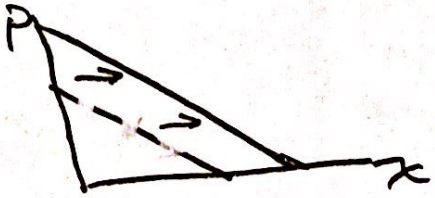
$\Rightarrow$ Price for cars drops $\Rightarrow$ Quantity of cars demanded increases... ?

(Tough Sell)

c) Gasoline Prices drop

Cars & Gasoline are complements

$\Rightarrow$ If price of gas drops, demand will increase $\Rightarrow$ shift right



d) Hamburgers ↑

$\Rightarrow$ Auto demand ↑ ?

(Tough Sell)

$\Rightarrow$ Answer is C