



HEALTH ECONOMICS

Title : Lecture 17

Lecture no :

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وَقَلِّبْ، يَا رَبِّ، زَيْجَنِي، عِلْمًا





Elasticity



Price elasticity of demand

Price elasticity of supply

ننظر للقيمة فقط ولا يفرق اذا الاشارة

negative or positive

لان نقوم بحساب تغير



Elasticity

[i-,la-'sti-sə-tē]

A measure of a variable's sensitivity to a change in another variable, most commonly referring to demand as affected by other factors.

Investopedia

Part 2

Dr. Omnia Elmahdy

The Midpoint Method: A Better Way to Calculate Percentage Changes and Elasticities

The midpoint formula is ^{أكثر دقة} more accurate when calculating the price elasticity of demand.

$$\text{Price elasticity of demand} = \frac{(Q_2 - Q_1) / [(Q_2 + Q_1) / 2]}{(P_2 - P_1) / [(P_2 + P_1) / 2]}$$

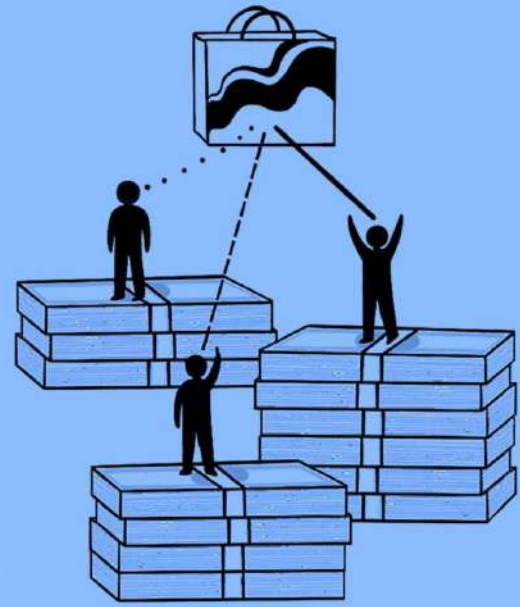
Example: If the **price** of an ice cream cone increases from P_1 **\$2.00** to P_2 **\$2.20** and the **amount** you buy falls from Q_1 **10** to Q_2 **8 cones**, then your elasticity of demand, using the midpoint formula, would be calculated as:

$$\frac{\frac{(10 - 8)}{(10 + 8) / 2}}{(2.20 - 2.00) / (2.00 + 2.20) / 2} = \frac{22\%}{9.5\%} = 2.32$$

Income Elasticity of Demand

- Income elasticity of demand measures how much the quantity demanded of a good responds to a change in demand التغيير في الدخل للزبائن الى اي حد سيؤثر على ال consumers' income.

كلما زاد دخل الشخص
فإن اقباله على شراء
السلع الغالية سيزيد
والعكس صحيح لو قل
الدخل سيعتمد الطلب
عنده على الضروريات



Income Elasticity of Demand

['in-,kəm i-,la-'sti-sə-tē əv di-'mand]

The sensitivity of demand for a certain good to a change in the real income of consumers who buy that good.

Investopedia

- It is computed as the **percentage change in the quantity demanded** **divided by** the **percentage change in income**.

$$\text{Income elasticity of demand} = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in income}}$$

Cheap goods Inferior Goods

عندما يقل
income
الشخص
demand for ال
inferior good
increases

Off Brand ice cream



Travel by
Train



Travel by a
bicycle



Wick
stove
موقد الموقد



Normal Goods High cost

عندما يرتفع
income
الشخص ال
demand for
normal good
increases

Branded ice cream



Travel by
aeroplane



Travel by
car



Gas stove
موقد الغاز



ليست
امور
ثابته انما
تختلف
من
شخص
لاخر

لو قدرتي الشرائية بسيطة رح اسافر بري افضل بالنسبة الي من
الجوي اما لو القدرة الشرائية عالية خيار السفر الجوي افضل

Types of Goods

- Normal Goods: roses, cars, home services, name-brand clothing, laptop, and technology equipment.
- Inferior Goods: generic products, used cars, discount clothing, and canned foods.

المنتجات العادية

Higher income raises the quantity demanded for normal goods but lowers the quantity demanded for inferior goods.

Normal Good

↑ An increase in income... → ↑ increases demand.

↓ A decrease in income... → ↓ decreases demand.

Inferior Good

↑ An increase in income... → ↓ decreases demand.

↓ A decrease in income... → ↑ increases demand.

كلما زاد الدخل زاد الطلب

Normal goods have **positive** income elasticities, while

كلما قل الدخل زاد الطلب

inferior goods have **negative** income elasticities

• Goods consumers regard as ^{اجتیب} necessities tend to be income inelastic

• Examples include food, fuel, clothing, and medical services. \Rightarrow inelastic

• Goods consumers regard as ^{رفاهیات} luxuries tend to be income elastic.

• Examples include sport cars, ^{فرد} furs, and expensive foods. \Rightarrow elastic



- Asma's **income rises from 20,000 SR to 22,000 SR** and the **quantity of hamburger** she buys each week falls from **2 kg to 1 kg**.

↳ **بالمسببة لانها اذارت رهنين** **لان ارتفاع دخلها قل طلبها عليه** ⇒ inferior اصبحت

- % change in quantity demanded = $(1-2)/1.5 = -.6667 = -66.67\%$

- % change in income = $(22,000-20,000)/21,000 = .0952 = 9.52\%$

- income elasticity = $66.67\% / 9.52\% = -7.00$

تعني ان هذه السلعة بالنسبة ل اسماء inferior

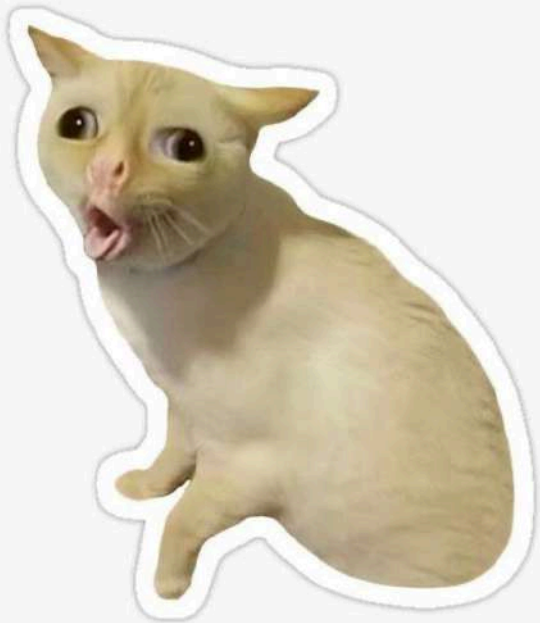
-7.00

So, Hamburger is an inferior good for Asma

income elasticity حساب

$$\text{Income elasticity} = \frac{\% \text{change in } Q}{\% \text{change in income}}$$

$$= \frac{\overset{\text{ذرف}}{(Q_2 - Q_1)} (1 - 2) / 1.5}{\overset{\text{ذرف}}{(Income_2 - income_1)} (22.000 - 20.000) / 21.000} \rightarrow (Q_2 + Q_1) \times \frac{1}{2} \rightarrow (Income_2 + income_1) \times \frac{1}{2}$$



نهتم هنا بالاشارة

Cross-price elasticity of demand

A measure of how much the quantity demanded of one good responds to a change in the price of another good, computed as the **percentage change in the quantity demanded of the first good** divided by the **percentage change in the price of the second good**

Cross Elasticity of Demand

[ˈkrɒs i-ˌlæ-ˈsti-sə-tē əv di-ˈmænd]

An economic concept that measures the responsiveness in the quantity demanded of one good when the price for another good changes.

نهتم هنا للإشارة في الحساب
رقم موجب substitutes
رقم سالب complements



Cross Price
Elasticity of
Demand Formula

$$= \frac{\text{Percent Change in a Quantity of Good A}}{\text{Percent Change in the Price of Good B}}$$



Substitutes have **positive cross-price** elasticities,

while **complements** have **negative cross-price**

elasticities

Brand-name

سعره ارتفع جدا في نفس الوقت هناك

substitutes

في هذه الحالة يزيد الطلب على البدائل ويقل على brand-name

تغيير سعر شيء واحد اثر على سلع اخرى

عندما يقل سعر سلعة معينة فإن demand على السلعة الاخرى يزداد مثل
عندما يقل سعر السجائر يزداد الطلب على المارجوانا (complements)

متفاعل

بطاريات

- A company producing **torches** and **batteries** is analyzing the cross-price elasticity of the two goods. For example, the **demand for torches was 10,000 when the price of batteries was \$10**, and the **demand rose to 15,000 when the price of batteries was reduced to \$8**.

لما قللت سعر البطاريات زاد الطلب على المشاعل مثل ماحدث بين الدخان والمارجوانا

عندما انخفض السعر ارتفع الطلب العلاقة هنا complements

- Percentage change in the number of torches

$$= [(15000 - 10000) / (15000 + 10000)] / 2 = 5000 / 12500 = 40\%$$

- Percentage change in price of batteries

$$= [(8 - 10) / (10 + 8)] / 2 = -2 / 9 = -22.22\%$$

لا يحتاج الحساب

Thus, cross-price elasticity of demand = 40%/-22.22% = **-1.8**

Since the cross-price elasticity of demand for torches and batteries is **negative**, thus these two are **complementary** goods.

- The **price of apples** rises from **\$1.00** per Kg to **\$1.50** per Kg.

As a result, the quantity of **oranges** demanded rises from **8,000** per week to **9,500**.

Substitutes

نتيجة لارتفاع سعر
التفاح زاد الطلب على
البديل وهو البرتقال

- **% change in quantity of oranges** demanded = $(9,500 - 8,000) / 8,000 = .1875 = \mathbf{18.75\%}$

- **% change in price of apples** = $(1.50 - 1.00) / 1.25 = .40 = \mathbf{40\%}$

- cross-price elasticity = $18.75\% / 40\% = \mathbf{0.47}$

Because the cross-price elasticity is **positive**, the two goods are **substitutes**

THE ELASTICITY OF SUPPLY

- **Price elasticity of supply** is a measure of **how much the quantity supplied** of a good responds to a **change in the price** of that good.
كلما يزيد السعر زاد ال supply
Law of supply
- Price elasticity of supply is the percentage change in quantity supplied resulting from a percent change in price.

PRICE ELASTICITY OF SUPPLY FORMULA

$$\text{PES} = \frac{\% \text{ Change in quantity supplied}}{\% \text{ Change in price}}$$

One of the important **determinants** of price elasticity of supply is the **nature of the product** itself. For example, goods that are essential for **basic needs**, such as food and clothing, tend to have a **relatively inelastic supply**, while **luxury goods**, such as jewelry and expensive cars, tend to have a **more elastic supply**.

هناك امور مثل اماكن (عددتها محدود) فلل عالبحر بالرغم من انها غالية جدا الا انها inelastic
لان لو زاد عدد الطلب على هذه الاماكن لن نستطيع توفيرها لانها اشياء محدودة ف احيانا تكون السلعة luxury and inelastic
مع مرور الوقت ايضا كمية ال supplied تزيد اي مع وجود تقنيات وهذه الامور القدرة على الانتاج تزيد

- The price of rice increased from 2.85 JD per kg to 3.15 JD per kg and the quantity supplied rises from 9,000 to 11,000 kg per month.

- % change in price = $(3.15 - 2.85)/3.00 \times 100\% = 10\%$

% change in quantity supplied = $(11,000 - 9,000)/10,000$

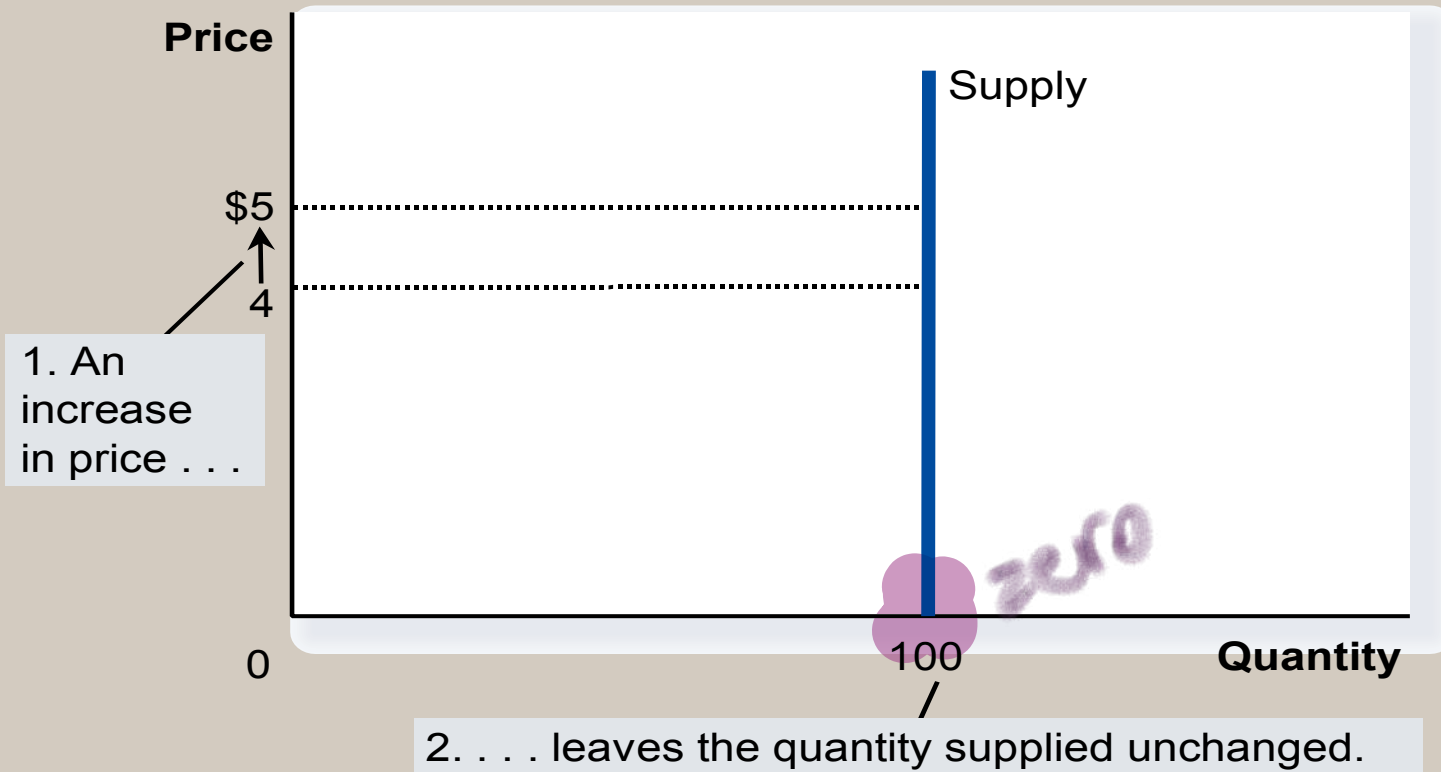
$\times 100\% = 20\%$

Price elasticity of supply = $(20\%)/(10\%) = 2$

Elastic

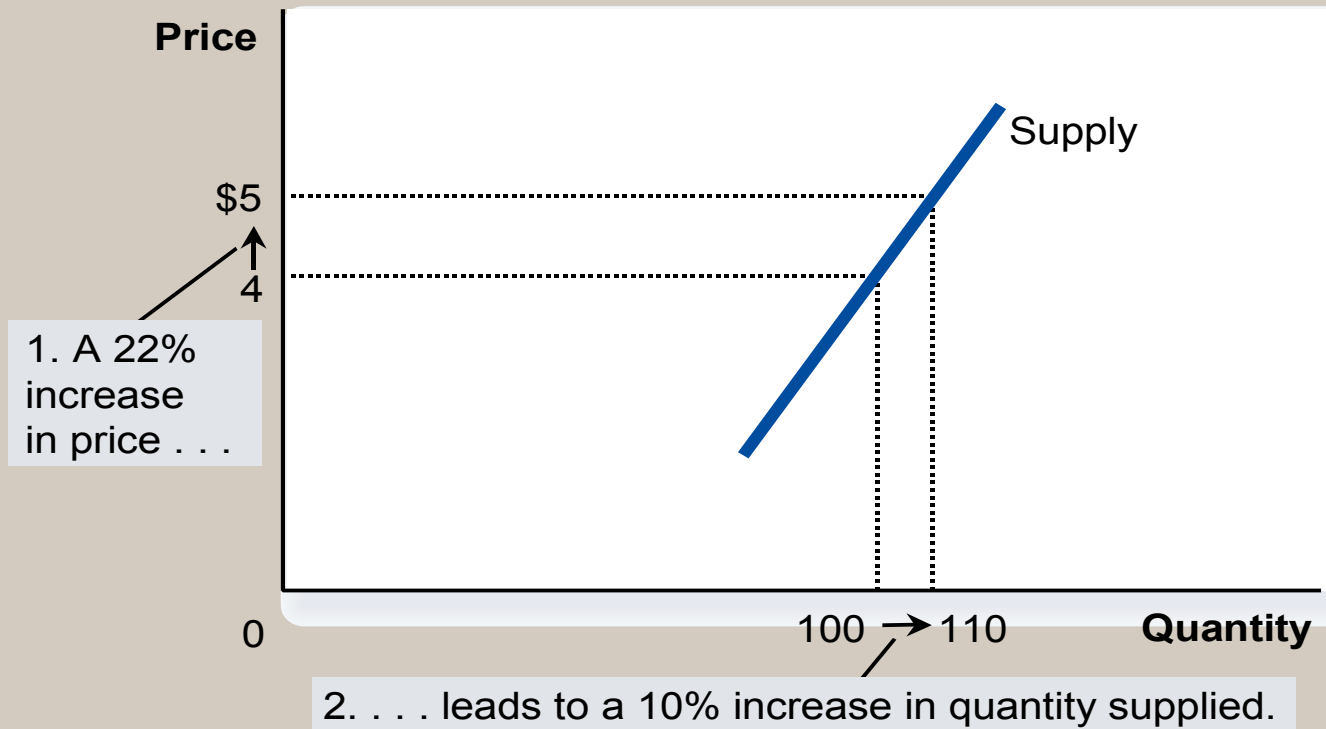
The Price Elasticity of Supply

(a) Perfectly Inelastic Supply: Elasticity Equals 0



The Price Elasticity of Supply

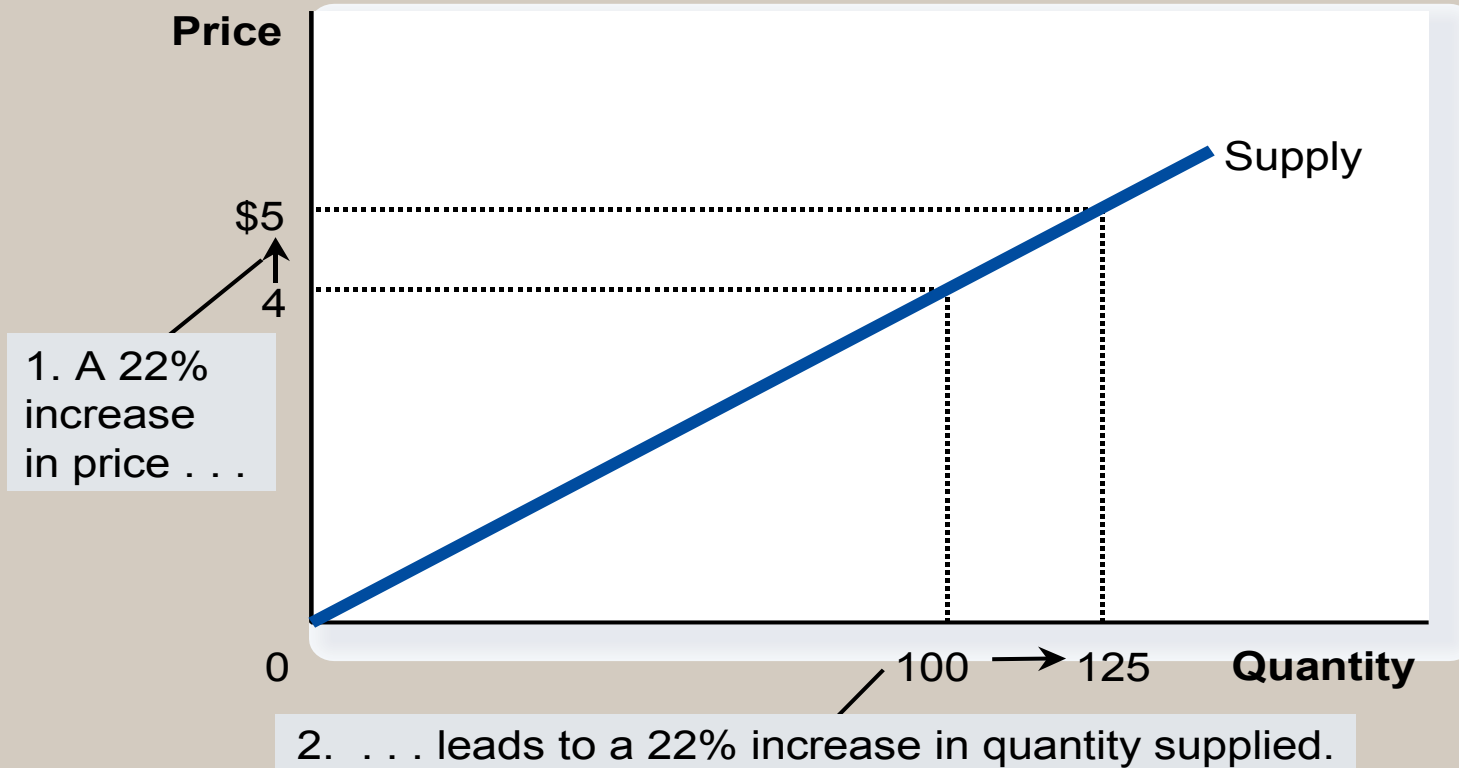
(b) Inelastic Supply: Elasticity Is Less Than 1



كلما السعر
زاد بنسبة
معينه
the amount
supplied
تزداد

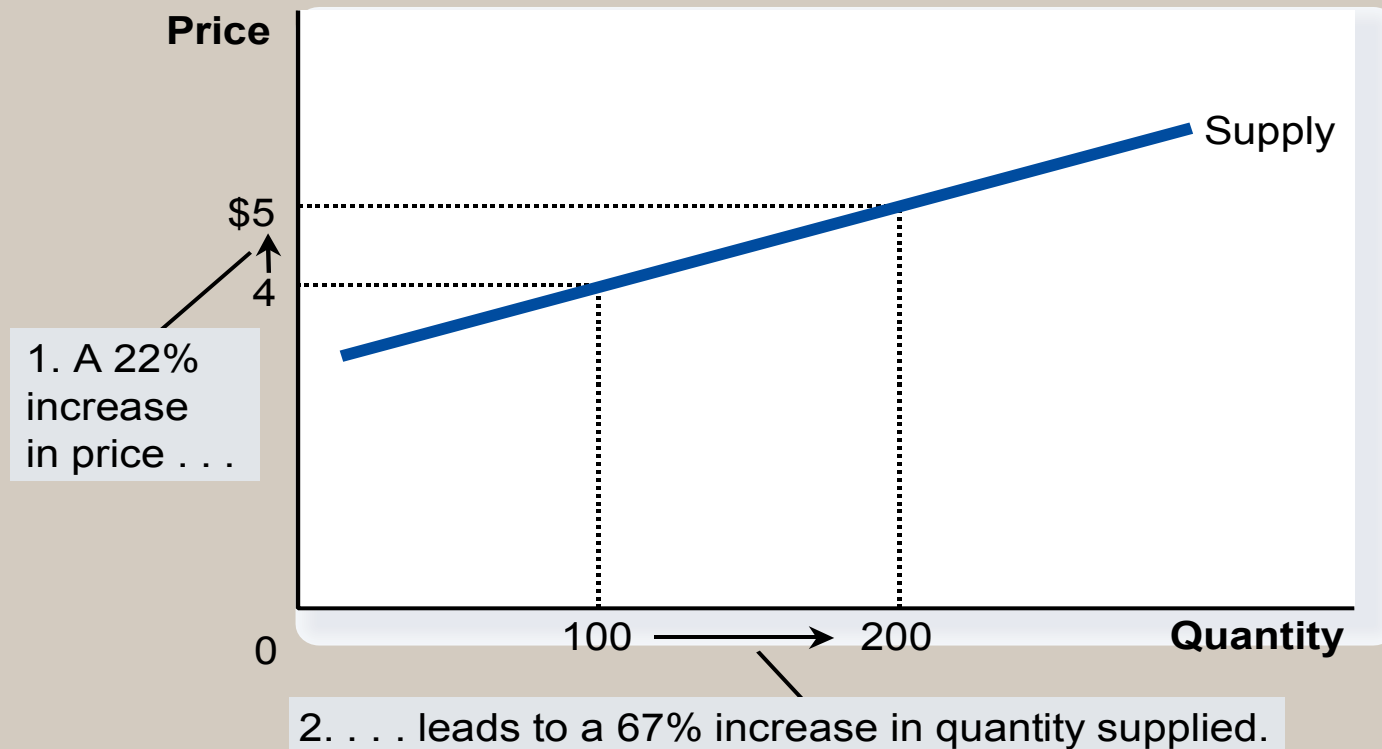
The Price Elasticity of Supply

(c) Unit Elastic Supply: Elasticity Equals 1



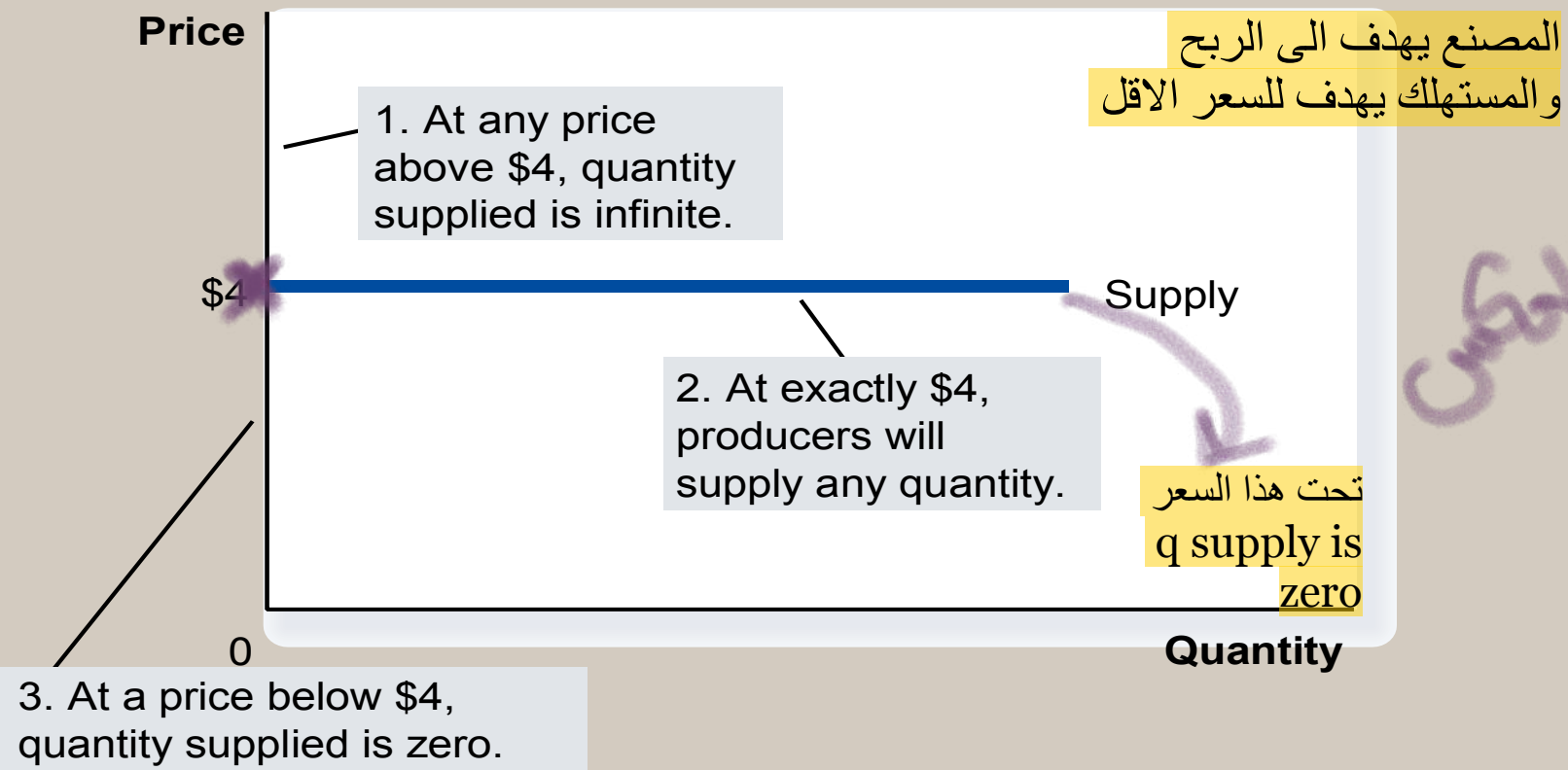
The Price Elasticity of Supply

(d) Elastic Supply: Elasticity Is Greater Than 1



The Price Elasticity of Supply

(e) Perfectly Elastic Supply: Elasticity Equals Infinity



TYPES OF ELASTICITY

- ❑ Elasticity is the degree of responsiveness in comparison to one variable to another variable

TYPES

INCOME ELASTICITY

- Change in demand due to change in real income
- Positive – normal goods
- Negative – inferior goods

CROSS ELASTICITY

- Change in demand due to change in price of other goods
- +ve means close substitute

PRICE ELASTICITY OF DEMAND

- Tells how a change in price impacts demand

PRICE ELASTICITY OF SUPPLY

- Tells about sensitivity of supply of product/service due to change in its market price

