



Chapter 5 Elasticity and Its Applications, p. 81

Outline:

- I. Price Elasticity of Demand**
- II. Price Elasticity of Demand - Graphically**
- III. Determinants of Price Elasticity of Demand**
- IV. Elasticity and Total Revenue**
- V. Elasticity of Supply
- VI. Elasticity of Supply Graphically
- VII. Determinants of Elasticity of Supply
- VIII. Income Elasticity
- IX. Cross-Price Elasticity of Demand
- X. Applications



Price elasticity of demand
– a measure that indicates
the degree of consumer
response to a price
change.

(% change in quantity)
(% change in price)

Who cares?

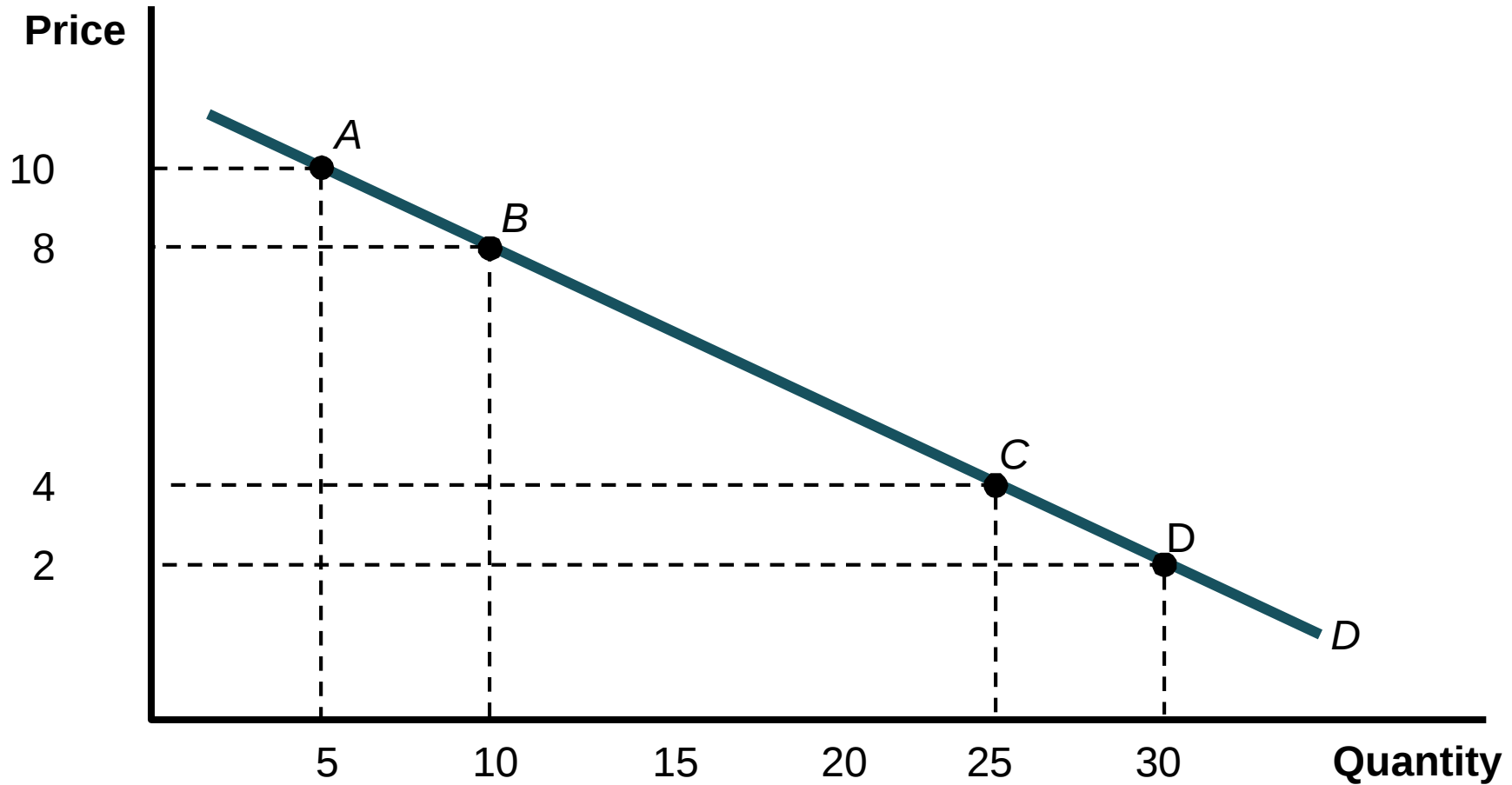
p.81

Midpoint Formula –Price elasticity of Demand

$$E_d = \frac{\% \Delta Q}{\% \Delta P} = \frac{\frac{\Delta Q}{(Q_o + Q_1)}}{\frac{\Delta P}{(P_o + P_1)}} = \frac{\frac{Q_1 - Q_o}{(Q_o + Q_1)}}{\frac{P_1 - P_o}{(P_o + P_1)}}$$

Note that the formula in the text has a 1/2 in the denominator and in the numerator. I don't include the 1/2 in the formula I give you because it cancels out anyway.

Calculating Price Elasticity of Demand, p. 82



example: Calculating E_d from point A to B

$$\mathbf{P_0=10, P_1=8, Q_0=5, Q_1=10}$$

$$E_d = \frac{\frac{10-5}{5+10}}{\frac{8-10}{10+8}} = \frac{\frac{5}{15}}{\frac{-2}{18}} = -\left(\frac{5}{15}\right)\left(\frac{18}{2}\right) = \left(-\frac{1}{3}\right)9 = -3$$

example: Calculating E_d from C to D

$$P_0=4, P_1=2, Q_0=25, Q_1=30$$

$$E_d = \frac{\frac{30 - 25}{25 + 30}}{\frac{2 - 4}{4 + 2}} = \frac{\frac{5}{55}}{\frac{-2}{6}} = -\left(\frac{5}{55}\right)\left(\frac{6}{2}\right) = \left(-\frac{1}{11}\right)3 = -\frac{3}{11}$$

How to interpret the elasticity coefficient:., p.82

- if $|E_d| > 1$ demand is elastic
 $\frac{|\% \Delta Q|}{|\% \Delta P|} > 1$
or $|\% \Delta Q| > |\% \Delta P|$

- if $|E_d| < 1$ demand is inelastic
 $\frac{|\% \Delta Q|}{|\% \Delta P|} < 1$
or $|\% \Delta Q| < |\% \Delta P|$
Does not imply that $\Delta Q = 0$

- if $|E_d| = 1$ demand is unitary elastic
 $\frac{|\% \Delta Q|}{|\% \Delta P|} = 1$
or $|\% \Delta Q| = |\% \Delta P|$

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In general, the greater the price elasticity of demand,

- a. the smaller the responsiveness of price to changes in quantity.
- b. the smaller the responsiveness of quantity to changes in price.
- c. the larger the responsiveness of price to changes in quantity.
- d. the larger the responsiveness of quantity to changes in price.

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Suppose that when the average price of a pack of cigarettes in Lexington falls from \$4.00 to \$3.00, the consumption cigarettes rises from 8,000 to 10,000 packs sold per week. What is the price elasticity of demand?

A. $-9/7$

B. $-7/9$

C. $-1/9$

D. $-1/7$



2) Suppose that when the average price of a pack of cigarettes in Lexington falls from \$4.00 to \$3.00, the consumption cigarettes rises from 8,000 to 10,000 packs sold per week

$$P_0 = \$4 \text{ and } P_1 = \$3$$

$$Q_0 = 8,000 \text{ and } Q_1 = 10,000$$

$$E_d = \frac{(10,000 - 8,000) / 18,000}{(3 - 4) / 7}$$

$$= \frac{2,000 / 18,000}{-1/7}$$

$$E_d = \frac{1/9}{-1/7} = (1/9)(-7/1) = -7/9$$

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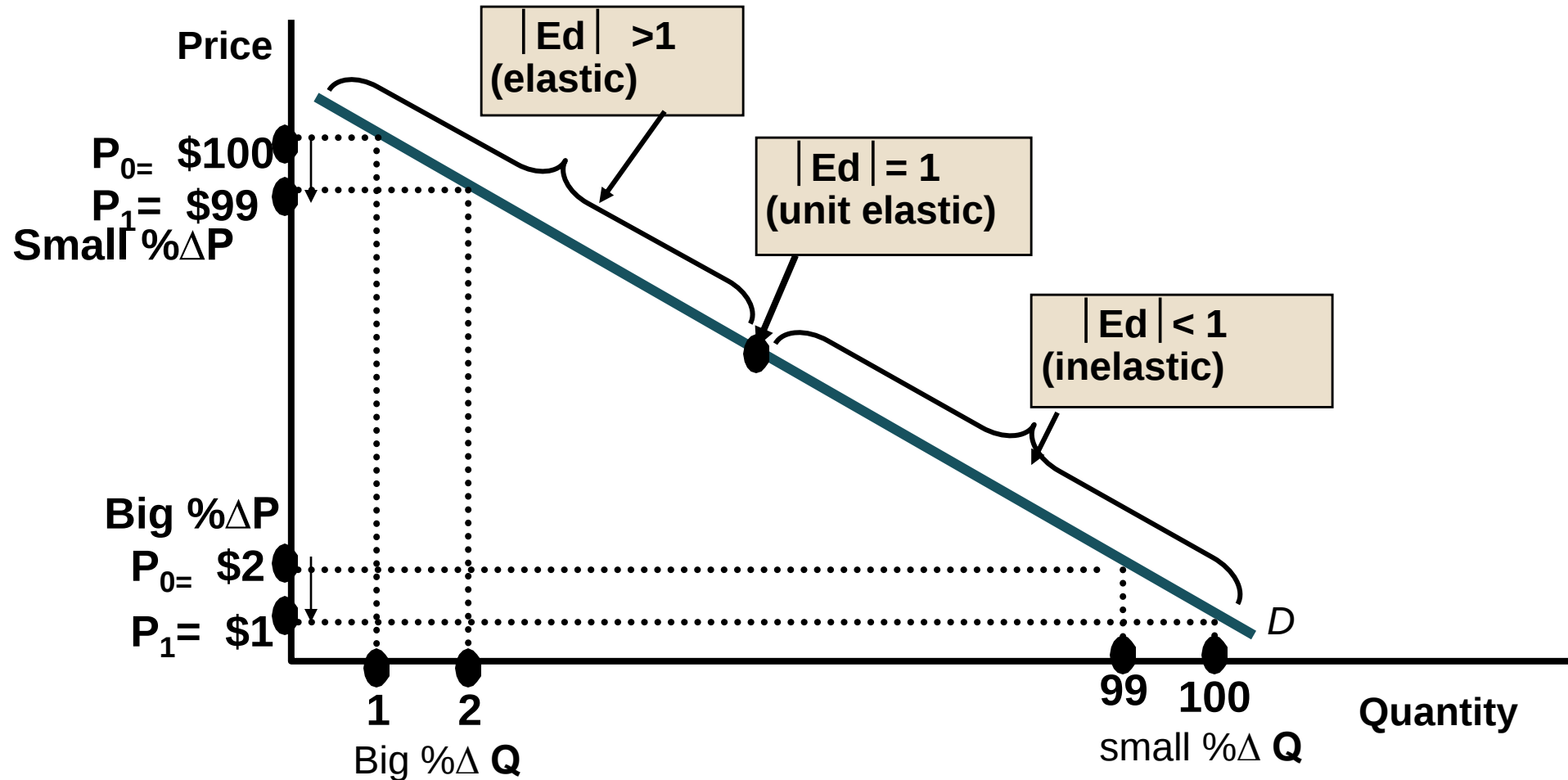
Given that the measure for E_d in the previous question was $-\frac{7}{9}$ this implies that the response to the price change was

- A. Elastic
- B. Inelastic
- C. Unit Elastic

II. Price Elasticity of Demand Graphically, p.84

Elasticity and Straight-Line Demand Curves

Demand is elastic on the upper region of the demand curve because, numerically, % changes in Q are relatively large while % P changes are relatively small.





Elasticity and Slope

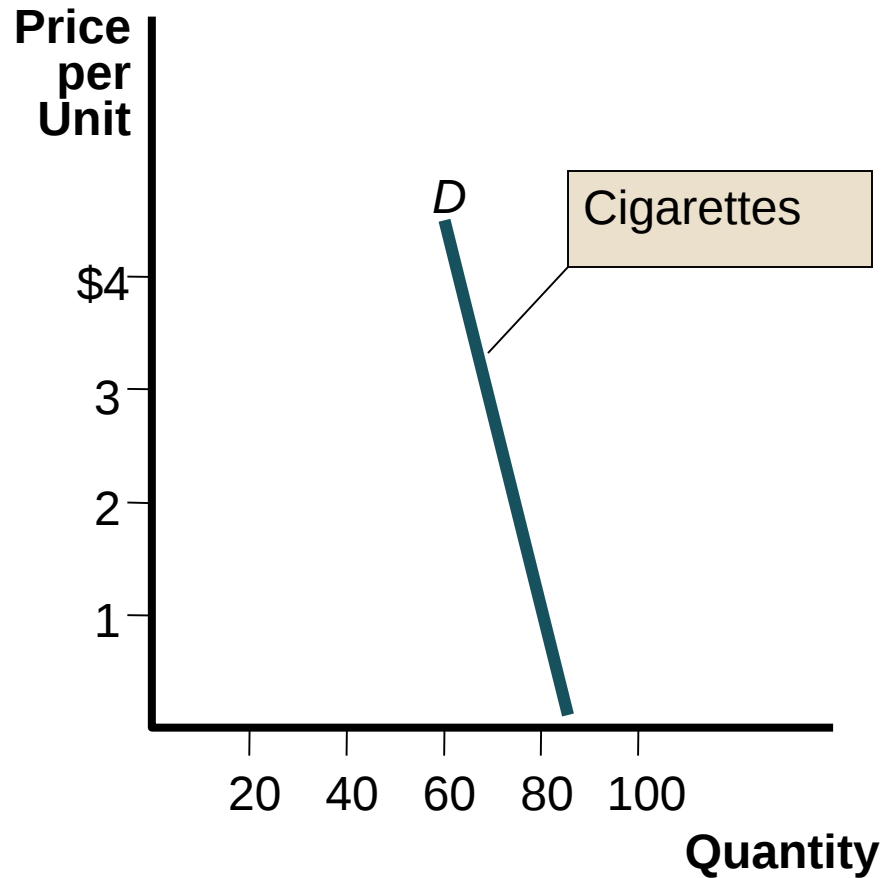
**Slope and elasticity are not the
same thing (two different
numbers)**

BUT

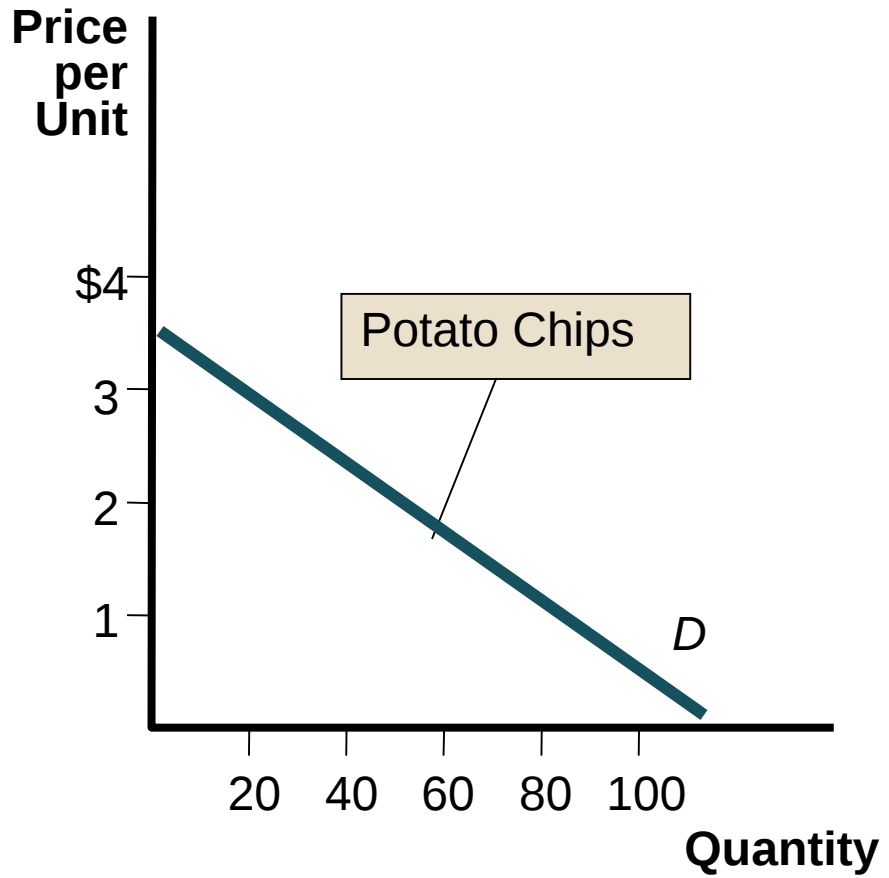
**Comparing relative slopes of two
demand curves allows you to
compare elasticity**

Question: Which is more elastic, the demand for cigarettes or the demand for potato chips? P.84

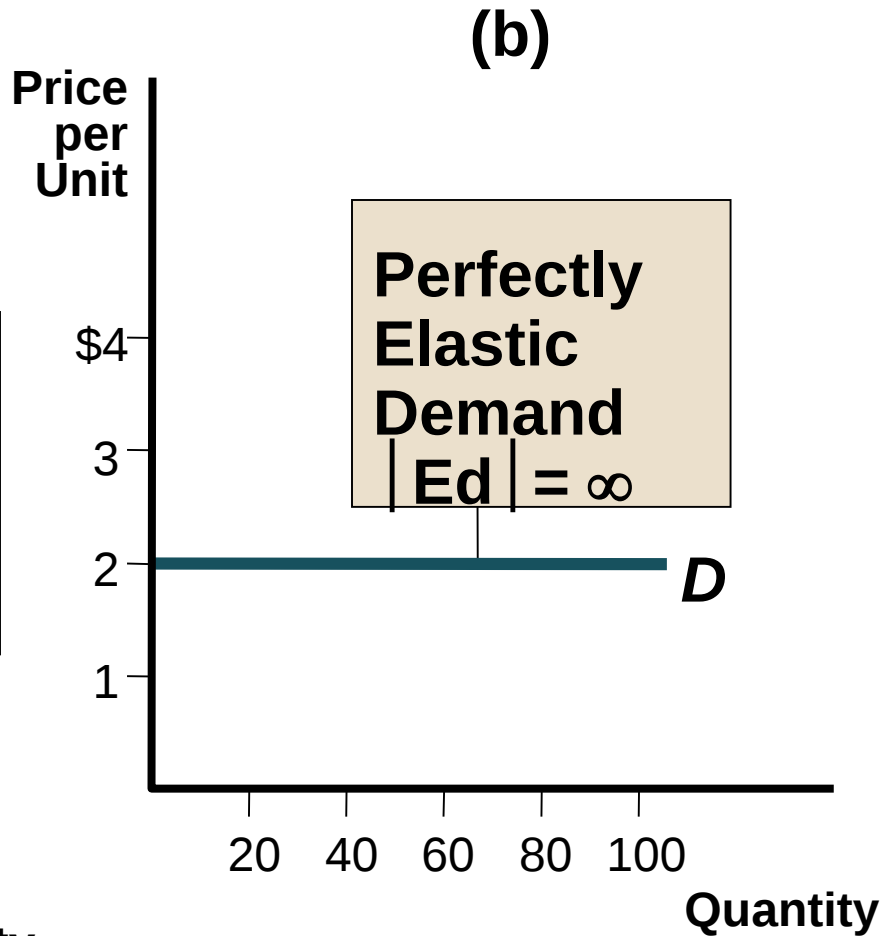
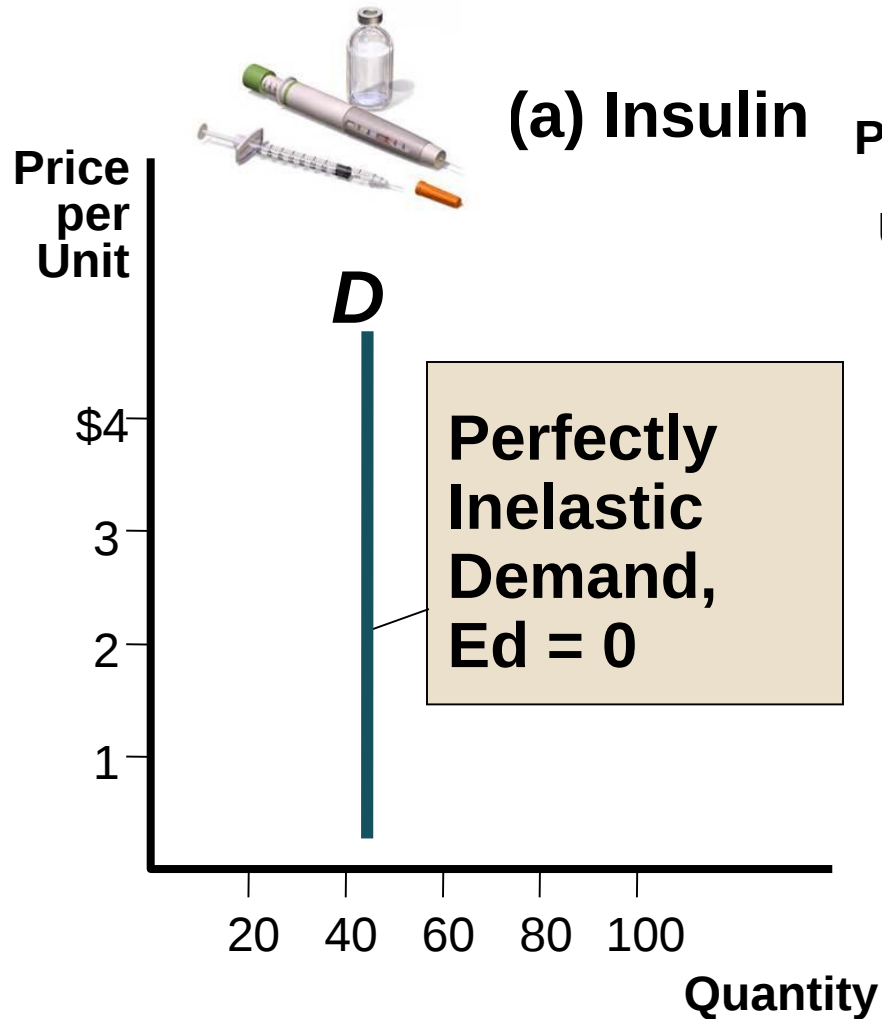
(a)



(b)



Extreme Cases of Demand, p. 85





III. Determinants of Price Elasticity of Demand, p. 86

1) The availability of substitutes

As # of available substitutes rises, demand becomes more elastic, (and vice versa)



2) The more the good is a necessity (rather than a luxury), the more inelastic demand will be.

RELATIVELY INELASTIC



RELATIVELY ELASTIC



3) Time Horizon: The more time buyers have to adjust to a price change, the more elastic the demand for a good becomes



LESS ELASTIC

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

October 2015

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

December 2015

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

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MORE ELASTIC

2015

JANUARY							FEBRUARY							MARCH						
Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su
				1	2	3							1	30	31					1
5	6	7	8	9	10	11	2	3	4	5	6	7	8	2	3	4	5	6	7	8
12	13	14	15	16	17	18	9	10	11	12	13	14	15	9	10	11	12	13	14	15
19	20	21	22	23	24	25	16	17	18	19	20	21	22	16	17	18	19	20	21	22
26	27	28	29	30	31		23	24	25	26	27	28		23	24	25	26	27	28	29

APRIL							MAY							JUNE						
Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su
				1	2	3							1	1	2	3	4	5	6	7
6	7	8	9	10	11	12	4	5	6	7	8	9	10	8	9	10	11	12	13	14
13	14	15	16	17	18	19	11	12	13	14	15	16	17	15	16	17	18	19	20	21
20	21	22	23	24	25	26	18	19	20	21	22	23	24	22	23	24	25	26	27	28
27	28	29	30				25	26	27	28	29	30	31	29	30					

JULY							AUGUST							SEPTEMBER						
Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su
				1	2	3							1	1	2	3	4	5	6	7
6	7	8	9	10	11	12	31	1	2					7	8	9	10	11	12	13
13	14	15	16	17	18	19	10	11	12	13	14	15	16	14	15	16	17	18	19	20
20	21	22	23	24	25	26	17	18	19	20	21	22	23	21	22	23	24	25	26	27
27	28	29	30	31			24	25	26	27	28	29	30	28	29	30				

OCTOBER							NOVEMBER							DECEMBER						
Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su
				1	2	3							1	1	2	3	4	5	6	7
5	6	7	8	9	10	11	30	1	2	3	4	5	6	7	8	9	10	11	12	13
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19	20	21	22	23	24	25	16	17	18	19	20	21	22	21	22	23	24	25	26	27
26	27	28	29	30	31		23	24	25	26	27	28	29	28	29					

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EVEN MORE ELASTIC

4) Definition of the Market: The more specific the classification for a good, the more elastic the demand is.



LESS ELASTIC



MORE ELASTIC



Region 13 Champs



p.87

Multi-tiered pricing:

Producers charge different
groups of consumers
different prices

IV. Elasticity and Total Revenue(TR), p.87

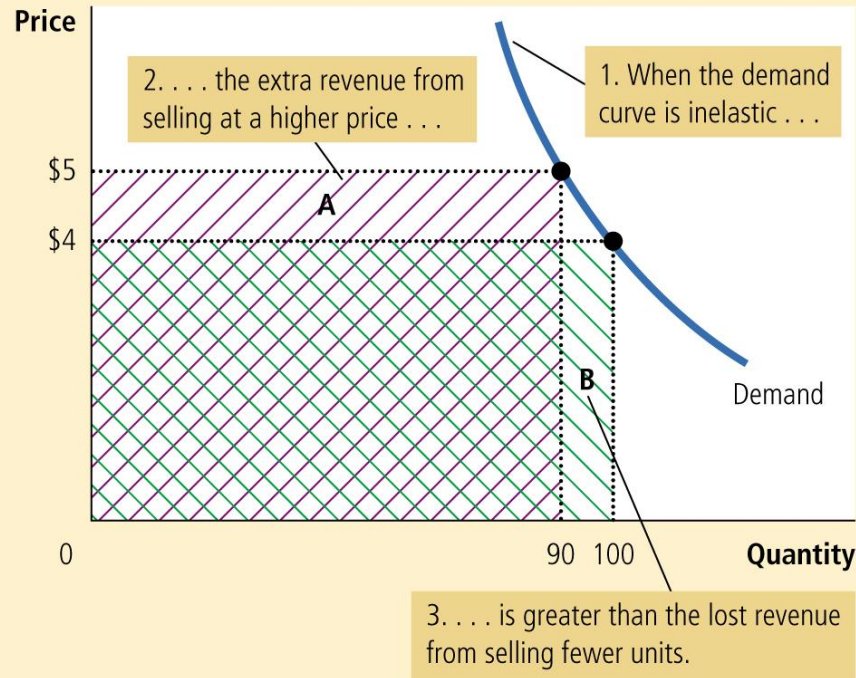
- Also called TOTAL EXPENDITURES
- $TR = (\text{price}) \times (\text{quantity})$
- Law of Demand
- As the price changes, the effect on total revenue depends upon the elasticity of demand.

FIGURE 3

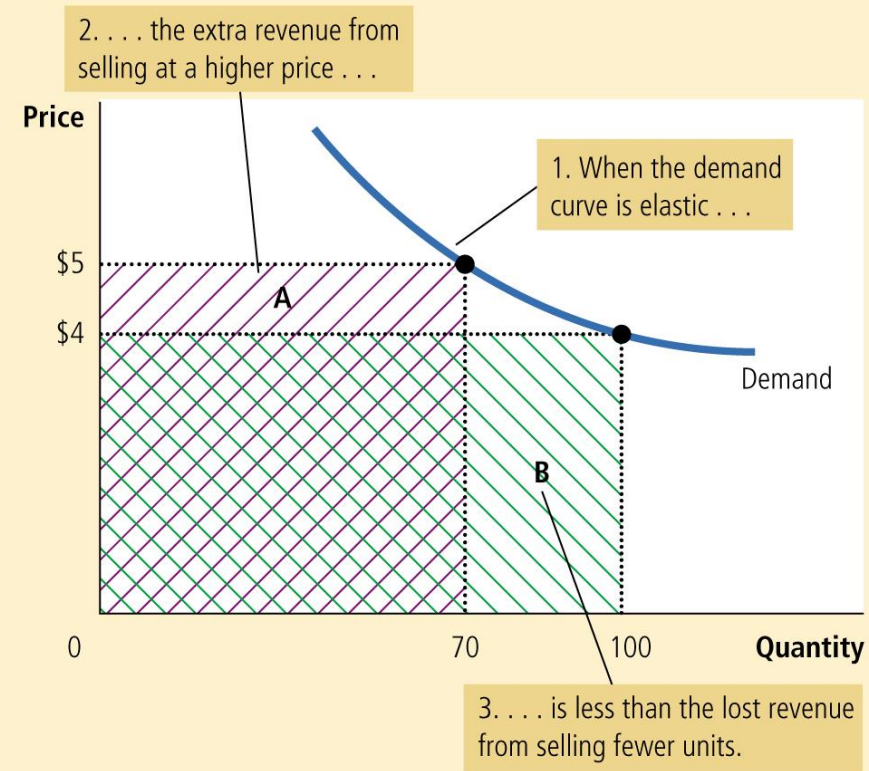
How Total Revenue Changes When Price Changes

The impact of a price change on total revenue (the product of price and quantity) depends on the elasticity of demand. In panel (a), the demand curve is inelastic. In this case, an increase in the price leads to a decrease in quantity demanded that is proportionately smaller, so total revenue increases. Here an increase in the price from \$4 to \$5 causes the quantity demanded to fall from 100 to 90. Total revenue rises from \$400 to \$450. In panel (b), the demand curve is elastic. In this case, an increase in the price leads to a decrease in quantity demanded that is proportionately larger, so total revenue decreases. Here an increase in the price from \$4 to \$5 causes the quantity demanded to fall from 100 to 70. Total revenue falls from \$400 to \$350.

(a) The Case of Inelastic Demand



(b) The Case of Elastic Demand



Relationship Between Elasticity (E_D) and Total Revenue, p. 88

- If $|E_D| > 1$ (elastic) as P increase TR decreases, as P falls, TR increases
($|\% \Delta Q| > |\% \Delta P|$)
- If $|E_D| < 1$ (inelastic) as P increases TR increases, as P falls, TR decreases
($|\% \Delta Q| < |\% \Delta P|$)
- If $|E_D| = 1$ (unitary elasticity) as P changes TR remains the same
 $|\% \Delta Q| = |\% \Delta P|$

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Suppose that President Capiluto says he plans to raise tuition next year by 2% to generate more revenue. What is he assuming about the student price elasticity of demand for attending the university?



- A. $|E_D| > 1$
- B. $|E_D| < 1$
- C. $|E_D| = 1$
- D. $|E_D| = \infty$