

Webnote 122

PeD

....the key ideas.

The formula...

PRICE ELASTICITY OF DEMAND:
THE SIMPLE or POINT FORMULA
**% CHANGE IN QUANTITY
DEMANDED**

% CHANGE IN PRICE

How to Calculate a % from 2 numbers

% change =

$$\frac{\Delta}{0} \times 100$$

Example:

20 to 25

$$5/20 = \frac{1}{4} * 100 = 25\%$$

Diagram 1: What is ped about?

price

If price increases from p_1 to p_2
then Q_d will change from q_2 to q_1 .

Will firm lose?

p_2

p_1

TR 1

TR2

TR 3

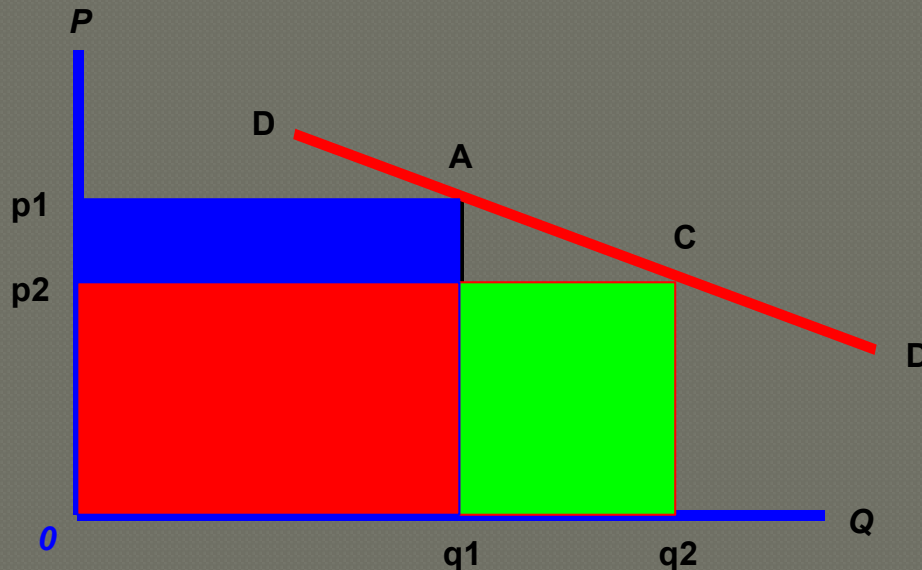
q_1

q_2

quantity

Diagram 1: What is ped about?

Diagram 1: Price elasticity of demand and total revenue



- **COMMENT: DIAGRAM 1**
- $0p1.0q1 = \text{TR blue} + \text{red}$
- $0p2. 0q2 = \text{TR green}$
- Is green $>$ blue/red or
- Blue/red $>$ green
- This is the key question for the firm. Will changing prices increase or decrease Total Revenue?

Note on diagram 1.....

Price Elasticity of Demand and Total Revenue

1. Assume in diagram 1 that price **rises** from p_2 to p_1
2. In diagram 1 DD is elastic: green area $>$ blue area
3. Total revenue will fall as area of $p_1.A.q_1.0 < p_2.C.q_2.0$
4. It is better however to prove this by formula: the simple price elasticity formula.
5. Simple formula: Percentage change in Q demanded divided by the percentage change in P.

What is ped about?

● Total Revenue

Calculate a % from 2 numbers

$$\% \text{ change} = \frac{\Delta}{O} \times 100$$

Example:

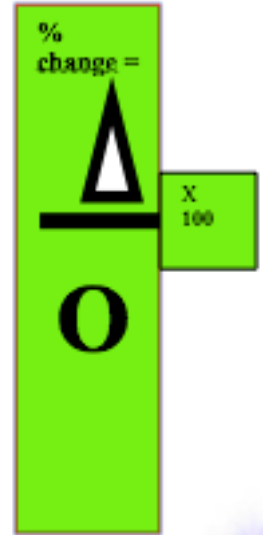
20 to 25

Example.....

● How to calculate a % change?



Use this
simple
formula



The diagram shows the formula for percentage change. It consists of a green vertical rectangle containing the text "% change =" at the top, followed by a large black triangle symbol (Δ) above a horizontal line, and a large black zero (0) below the line. To the right of the horizontal line is a small green square containing the text "x 100".

$$\frac{\Delta}{O} \times 100$$

- Price goes from 20 to 25.
- Divide the change by the original and multiply by 100
- Change = 5. Original price = 20
- $= 5/20 = 0.25 \times 100 = 25\%$

Can you calculate....

demand schedule		
P	Q	TR = P x Q
25	100	2500
20	200	4000
15	250	3750
10	300	3000

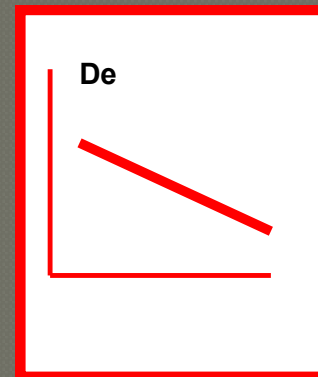
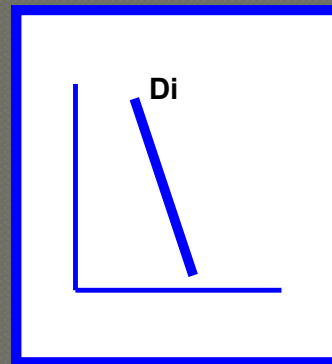
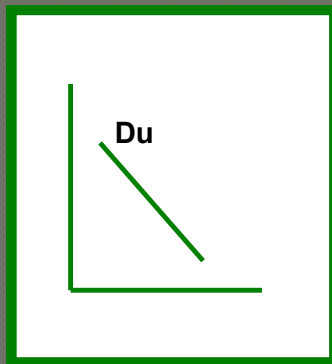
RESULTS:

Task: calculate ped for a price **fall** in each of the 3 cases e.g 15 to 10

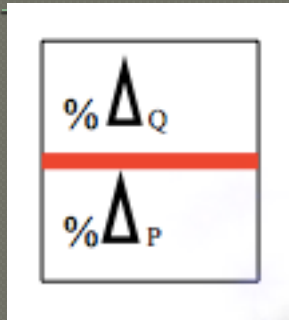
Calculate for price Price Rises:

Task: calculate ped for a price **rise** in each of the 3 cases e.g 10 to 15 etc

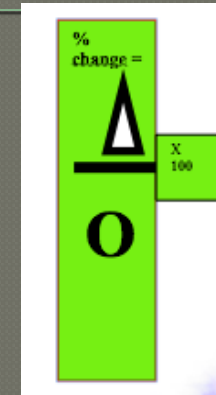
$$\frac{\% \Delta Q}{\% \Delta P}$$



Can you calculate....



Price	Quantity
25	100
20	200
15	250
10	300



Price Fall

Calculate for price Price Rises:

1. ans = -5 (25-20)
2. ans = - 1 (20-15)
- 3 ans = -0.61 (15-10)

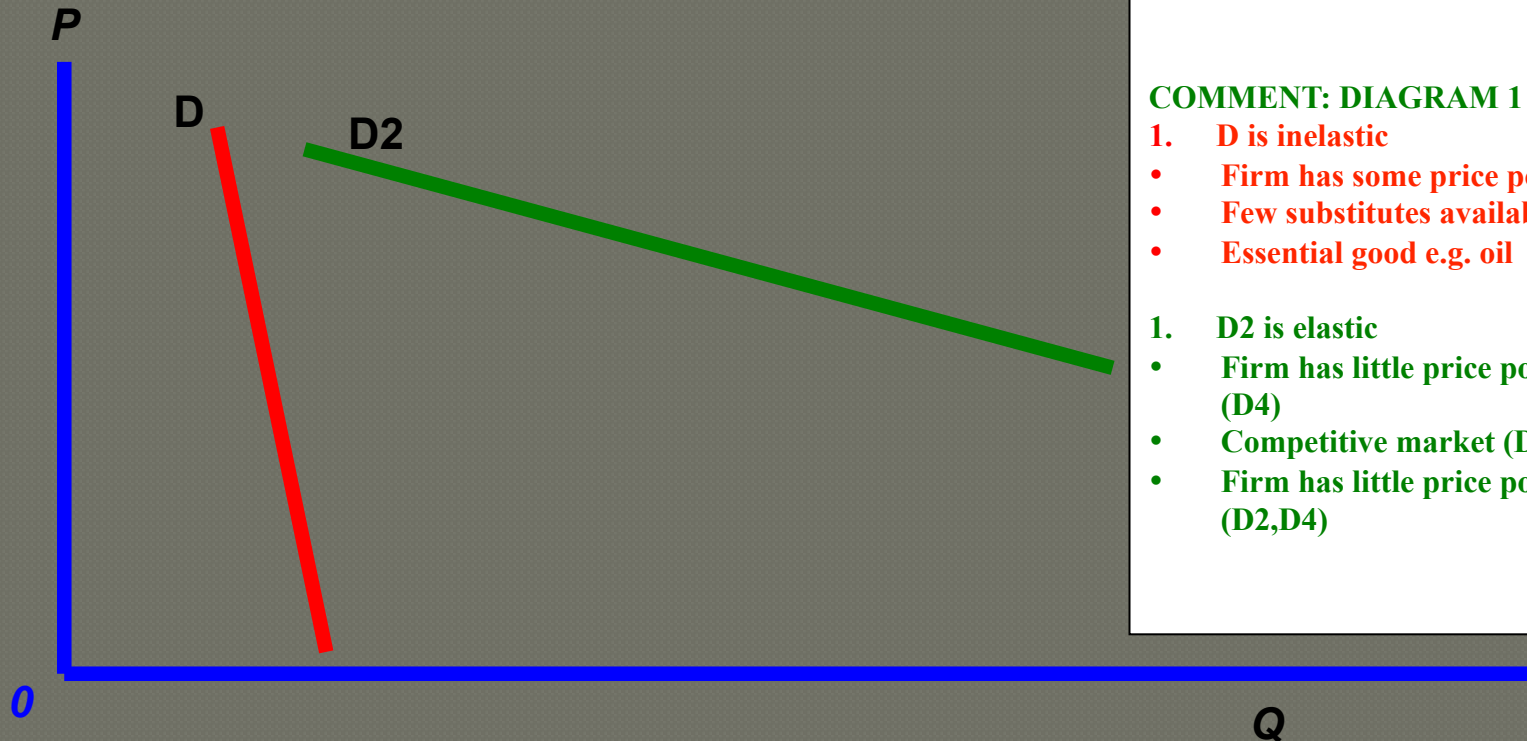
Price Rise

Calculate for price Price Rises:

1. ans = -2 (20-25)
2. ans = - 0.6 (15-20)
- 3 ans = -0.33 (10-15)

Elastic or inelastic?

Diagram 1: shape of the demand curve



PRICE POWER

COMMENT: DIAGRAM 1

1. D is inelastic

- Firm has some price power
- Few substitutes available
- Essential good e.g. oil

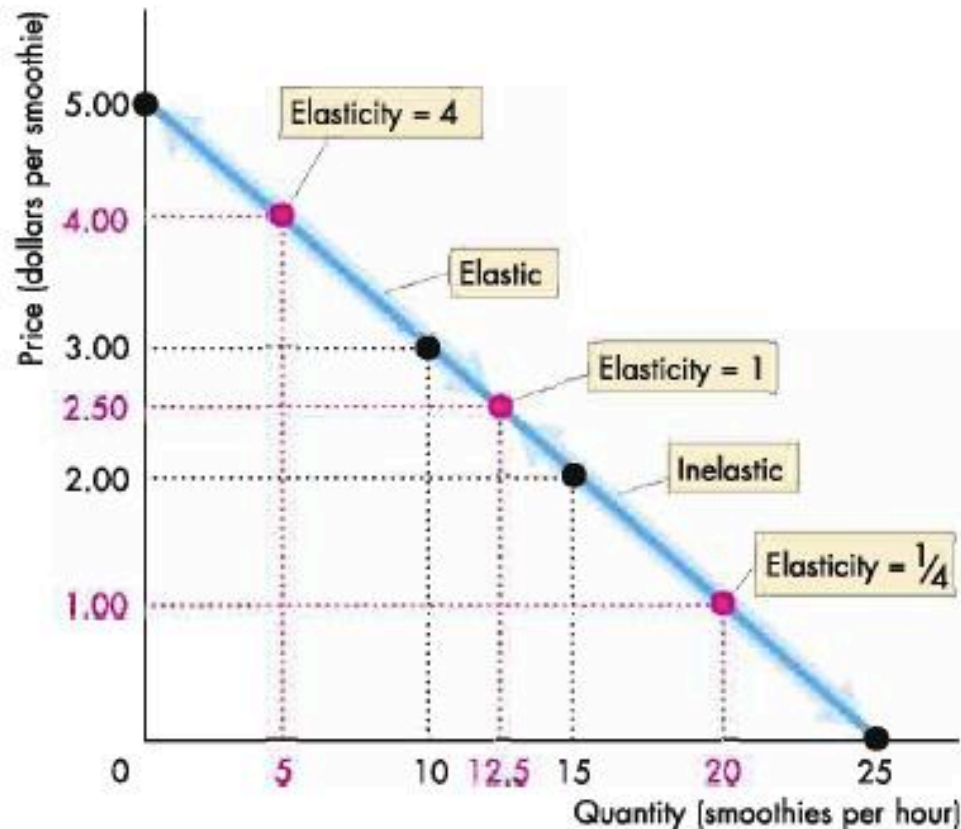
1. D2 is elastic

- Firm has little price power (D4)
- Competitive market (D2,D4)
- Firm has little price power (D2,D4)

What does the integer value mean?

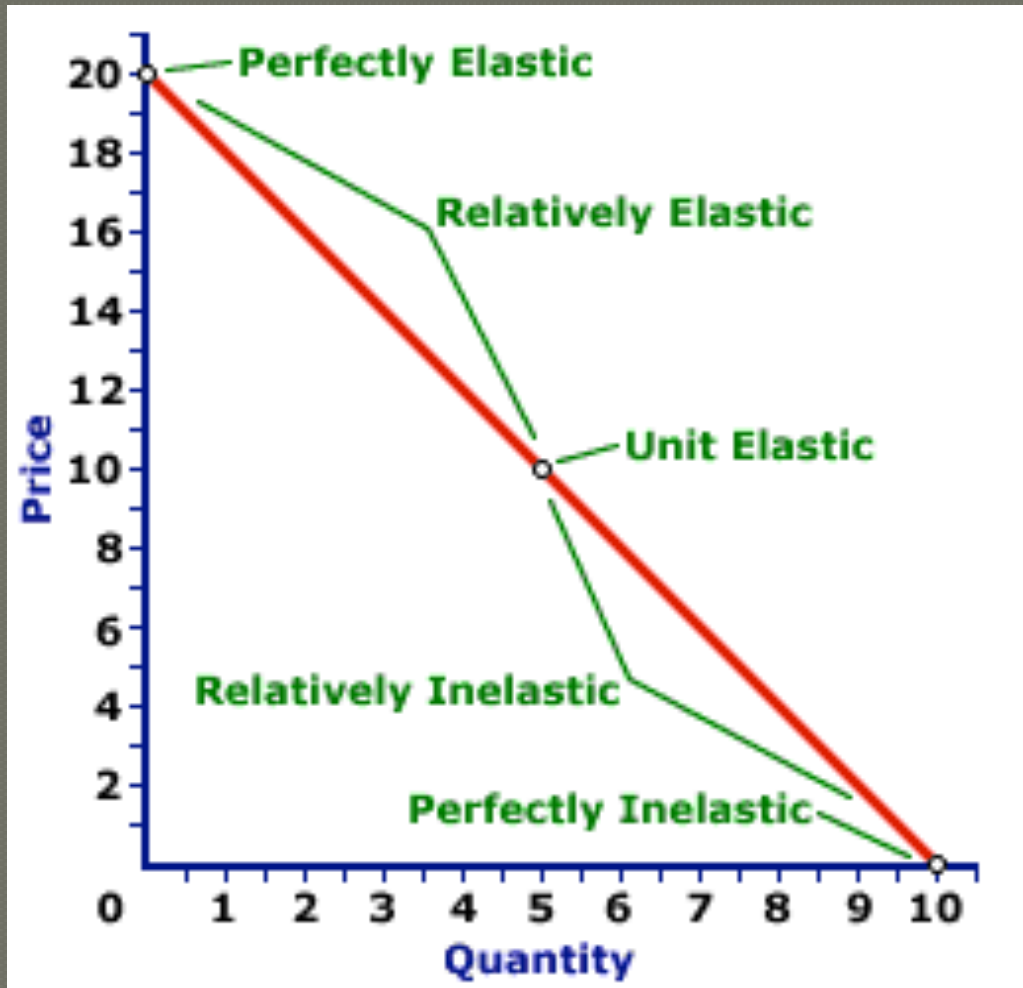
ELASTICITY	What it means ?	Type of good
$E_d = -5$	If $p + 10\%$ then q_d falls by 50%	luxury goods
UNITARY ELASTIC $E_d = -1$	% Change in p = change in q	Normal goods
IN ELASTIC $E_d = -.61$	10 % Change in p sees a 6 % (approx) change in q	essential goods some foods, fuel, drugs

Elasticity along a straight line



On a linear demand curve, elasticity decreases as the price falls and the quantity demanded increases. Demand is unit elastic at the midpoint of the demand curve (elasticity is 1). At prices above the midpoint, demand is elastic; at prices below the midpoint, demand is inelastic.

Why?

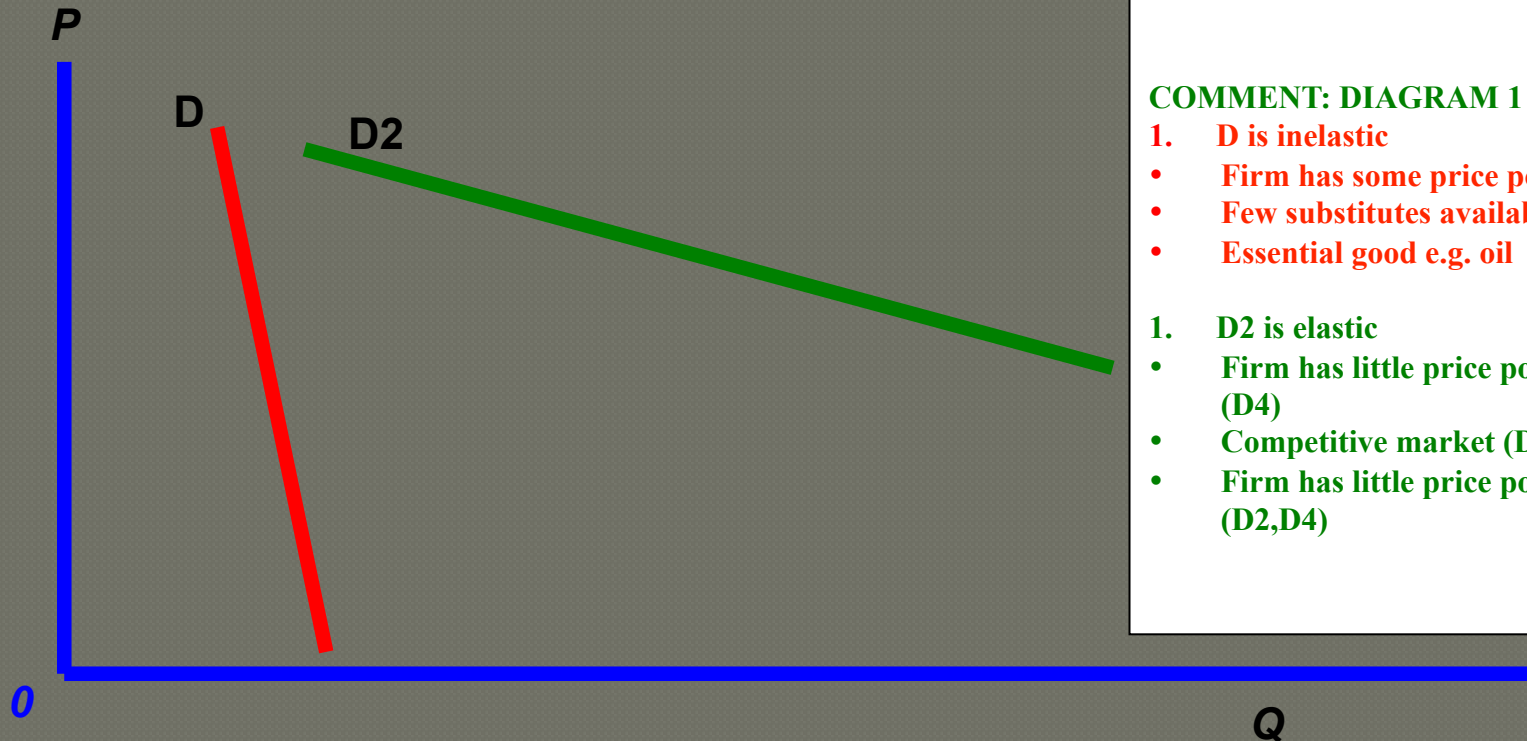


Mathematical explanation

But it's also logical:
The demand for higher priced goods is more sensitive to price changes.

Elastic or inelastic?

Diagram 1: shape of the demand curve



PRICE POWER

COMMENT: DIAGRAM 1

1. D is inelastic

- Firm has some price power
- Few substitutes available
- Essential good e.g. oil

1. D2 is elastic

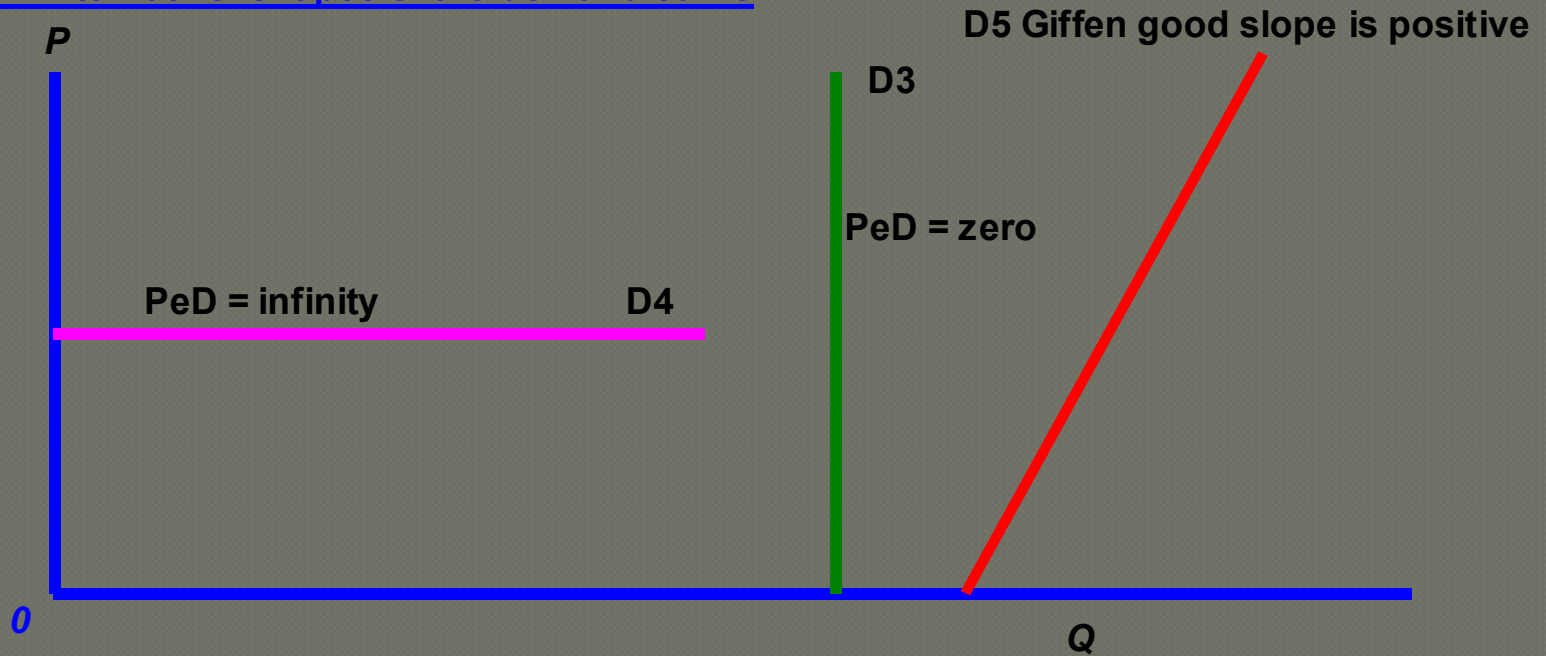
- Firm has little price power (D4)
- Competitive market (D2,D4)
- Firm has little price power (D2,D4)

7 factors that influence ped?

- 1. The number and closeness of substitutes**
- 2. The passage of time**
- 3. Addiction / habit**
- 4. % of income spent on the good/ service**
- 5. Branding and advertising**
- 6. Durability**
- 7. Expectations of price changes / inconsistent**

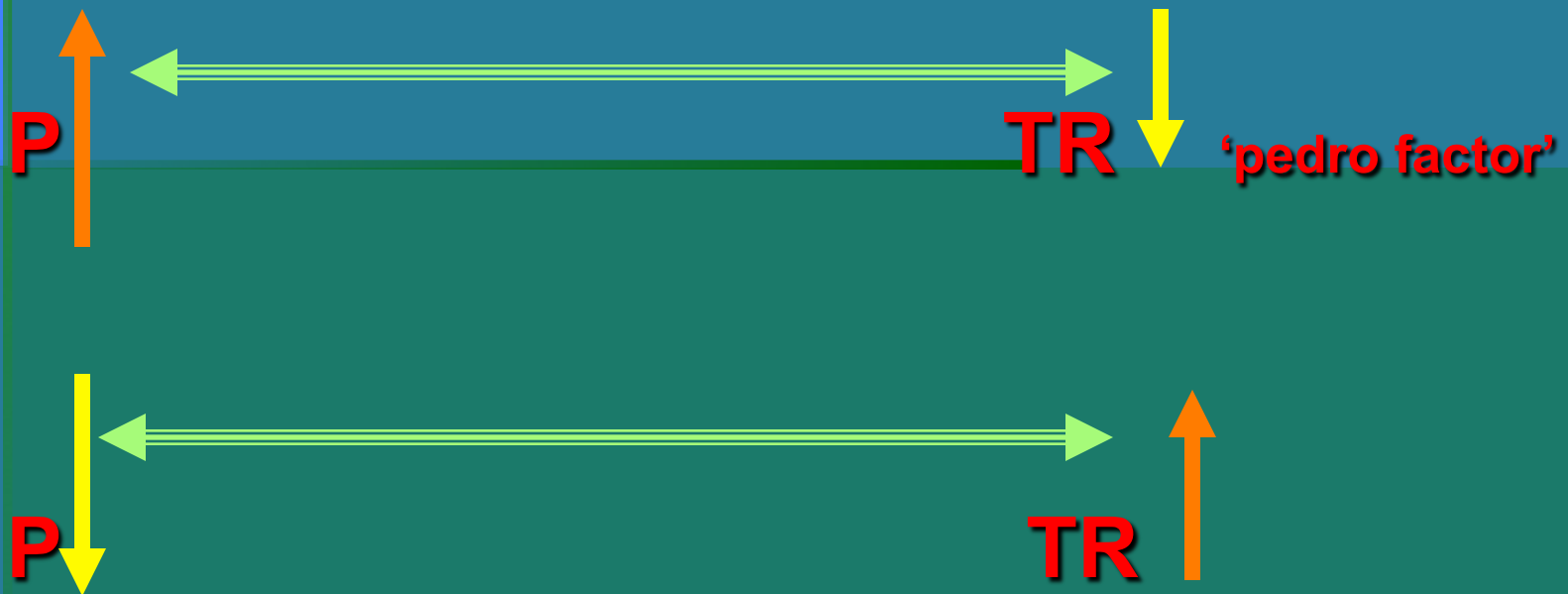
Infinity, zero and Giffen goods....

Diagram 2: Alternative shapes of the demand curve



PeD and TR: what you need to remember

1. P e d Elastic: effect on TR (p x q)

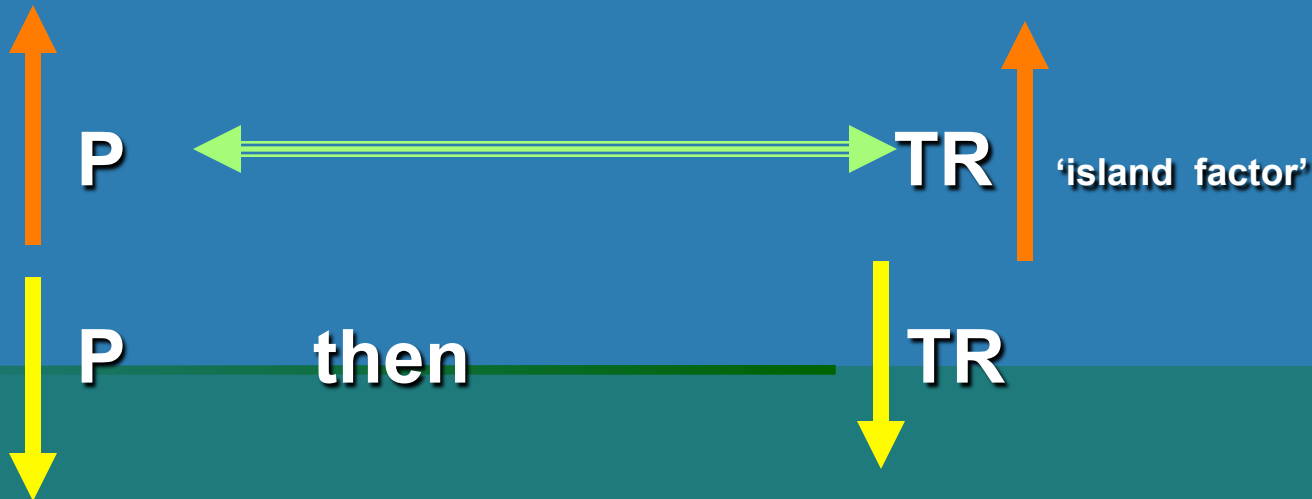


Note: total revenue moves in opposite direction to price

PeD and TR: what you need to remember

Ped inelastic

effect on TR ($p \times q$)



Note: total revenue moves in same direction as price