Answer on Question #74220 - Economics / Microeconomics

Question: Given the demand equation

$Q = 12{,}000 - 10P^2$

a). For this equation, write the expression for the point price elasticity of demand as a function of P.s

Answer:

$Q = 12000 - 10P^2$

First order of this equation is:

$$\frac{dQ}{dP} = -20P$$

The point price elasticity of demand can be expressed as:

$$E_P = \frac{\left(\frac{dQ}{dP}\right)}{\left(\frac{Q}{P}\right)}$$

$$E_P = \frac{(-20P)}{\left(\frac{Q}{P}\right)}$$

$$E_P = \frac{-20P^2}{Q}$$

b). Over what range of prices is the demand inelastic?

Answer:

If the price is 5 than quantity demanded will be:

$Q = 12000 - 10(5)^2$

$Q = 11750 \ldots\ldots\ldots\ldots\ldots\ldots (1)$

When, the price is 10 than quantity demanded will be:

$Q = 12000 - 10(10)^2$

$Q = 11000 \ldots\ldots\ldots\ldots\ldots\ldots (1)$

The price elasticity of demand is:

$$E_P = -10 \times \frac{5 + 10}{11750 + 11000}$$

$E_P = -0.004\ or - 0.44\%ss$

The price elasticity is negative that means the demand inelastic in the price range of (5; 10).