

60 If the demand function for a product is given by ~~2500 - p~~

$$p^2(2q+1) = 100000$$

find the rate of change of quantity with respect to price when $p = 50$. Interpret this result

$$p^2(2q') + (2q+1)(2p) = 0$$

$$\rightarrow 2p^2q' + 4qp + 2p = 0$$

$$\frac{2p^2q'}{2p^2} = \frac{-4qp - 2p}{2p^2} = \frac{-4qp - 2p}{2p^2}$$

$$\therefore q' = \frac{-4qp - 2p}{2p^2} = \frac{-2p(2q+1)}{2p^2}$$

$$\rightarrow q' = -(2q+1)$$

$$\frac{-2(19.5+1)}{50} = -0.8$$

$$q' = \frac{-2q+1}{2} = -2q+1 = 0 \Rightarrow q = \frac{1}{2}$$

~~Handwritten scribbles and calculations~~

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