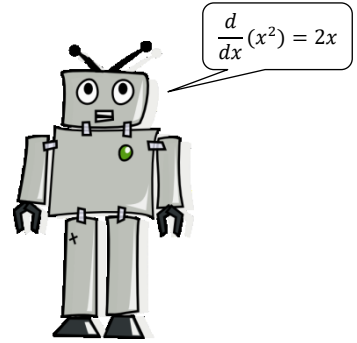


1. Calcubot sells robots that can answer calculus questions by simply asking them outloud. They cost \$50 per robot to make, and are sold for \$150 per robot. At this price, they have been selling 100 robots per month. The owner of Calcubot is planning to lower her price, and estimates that for each \$5 reduction in price, 10 more robots will be sold each month. At what price should the robots be sold to maximize profit?



Let p = price per robot

$P(p)$ = total profit when sell at price p .

$P(p) = (\# \text{ robots sold}) (\text{profit per robot})$

p	q
150	100
145	110
140	120
\vdots	\vdots

$$m = \frac{110 - 100}{145 - 150} = \frac{10}{-5} = -2$$

$$q - 100 = -2(p - 150)$$

$$q - 100 = -2p + 300$$

$$q = 400 - 2p$$

$$= (400 - 2p)(p - 50)$$

$$= -2p^2 + 500p - 20000$$

$$P'(p) = -4p + 500$$

$$= 2(250 - 2p)$$

$$P'(p) = 0:$$

$$2(250 - 2p) = 0$$

$$p = 125$$

$$P'(p) \text{ DNE:}$$

Nowhere

Profit maximized when
sell for \$125 per robot.

Q: A man is driving his son to school. They get into an accident and the man dies. The son is rushed to the hospital and when he arrives for emergency surgery the doctor says "I can't operate on this boy, HE'S MY SON!" The boy was not adopted. How is this possible?