MAXIMUM PROBLEMS in Realistic Contexts.

1. A cinema manager finds that when the price of a ticket is $12, she gets an audience of 100 people (on average) but for every $1 increase the number of people goes down by 10.
   Use calculus to find what ticket price produces the most profit.
   If x represents the ticket price and y represents the amount of money collected then $\boldsymbol{y = x(320 - 10x)}$

2. When the cost of a bag of potatoes is $5 a supermarket sells 40 bags a day. For every $1 increase in price they sell 4 bags a day less.
   Use calculus to find what price per bag produces the most money collected.
   If $\boldsymbol{x}$ represents the price per bag and $\boldsymbol{y}$ represents the amount of money collected then $\boldsymbol{y = x(60 - 4x)}$

3. When the cost of a bag of kumara is $5 a supermarket sells 30 bags a day. For every $1 increase in price they sell 4 bags a day less.
   Use calculus to find what price per bag produces the most money collected.
   If $\boldsymbol{x}$ represents the price per bag and $\boldsymbol{y}$ represents the amount of money collected then $\boldsymbol{y = x(50 - 4x)}$

4. A dairy farmer notices that the average amount of milk per cow is 14 litres a day when he puts 30 cows in his paddock, however, for every 5 cows added, the average amount of milk goes down by 1 litre a day.
   Use calculus to find how many cows he should put in the paddock to get the most milk and find the maximum amount of milk he could get.
   If x represents the number of cows and y represents the total amount of milk produced in litres then $\boldsymbol{y = x\left(20 - \frac{x}{5}\right)}$