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## Graded Assignment 2 - Additional Products for Andy's Coffee Shop

### Part 1: Cookies

1.0/1.0 point (graded)

Andy is also thinking of selling cookies. He found the following profit function for cookie sales in terms of selling price  $p$ :

$$1332 * p - 393 * p^2 - 596.$$

Andy would like to know the *lowest* price that he can set to have a positive profit from selling cookies.

Identify the lowest price that still results in a non-negative profit for Andy.  
Round your answer to two digits (e.g. if the result is 1.534 put in as an answer 1.53).



You have used 1 of 2 attempts

### Part 2: Cookies (cont')

1.0/1.0 point (graded)

Consider the profit equation given in Part 1 to answer the following question.  
Select all correct answers

☐ The function is convex.

☒ The function is concave.☐ The function is convex for negative values of  $p$ .☐ The function is convex for  $p > 0$ .☐ None of the above

Submit

You have used 1 of 2 attempts

### Part 3: Cake

1.0/1.0 point (graded)

Andy also wants to offer a signature cake every day in the afternoon. From a friend, he learned that the demand for cake is captured best by using a power function of type  $a * p^{(-b)}$  where  $a > 0$  and  $b > 0$ . From past experience of running a pastry shop, his friend told him a good estimate for the first parameter is  $a = 41.3$ . Andy also thinks that he can sell 30 pieces of cake at 2 Euros a piece.

What is the value of the demand function elasticity parameter  $b$ .

Round your answer to two digits (e.g. if the result is 1.534 put in as an answer 1.53).

0.46



Submit

You have used 1 of 2 attempts

### Part 4: Buying Flour

1.0/1.0 point (graded)

Andy also starts working on operational questions. Among other things he wonders how many packets of flour he will have to order to bake cakes and cookies. He expects that he needs  $D = 816$  packs of flour per year and flour costs  $c = 0.76$  Euros per pack. For each order he

has to pay a transportation fee of  $A=22$  Euros. Andy recalls the total logistics cost equation from class:

$$\text{cost} = c * D + A * D / Q$$

Assume that Andy is willing to spend 1100 Euros on flour.

How many packets  $Q$  of flour should Andy buy per order?  
Round your result down to the nearest integer.



You have used 1 of 2 attempts

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## Part 5: Sweets

1/1 point (graded)

While planning his Espresso bar, Andy works at a candy shop. The owner offers two different signature sweets with a light and a strong toffee flavour. To make a kilogram of the light flavored sweets, Andy uses 220.0 g of dark chocolate and 80.0 g of toffee (other ingredients go into it but are not important to Andy's analysis). To make a kilogram of the strong flavored sweets, he uses 100.0 g of dark chocolate and 420.0 g of toffee. The owner asks him to apply his mathematical expertise to estimate how many kilogram of light and strong flavoured sweets he can produce with an inventory of 9.25 kg of dark chocolate and 11.91 kg of toffee.

Calculate how many kilogram of light and strong flavored sweets Andy can make and best utilize the available dark chocolate and toffee inventory!

Round your result to one decimal digit.

Hint: Formulate an equation to calculate how much dark chocolate Andy needs in which  $x_L$  represents the amount of light flavored sweets and  $x_S$  the amount of strong flavored sweets. Formulate a second equation to capture how much toffee he needs. Solve this system of two equations for the variables  $x_S$  and  $x_L$  to answer the question.

Amount of light flavored sweets:



\(\)

Amount of strong flavored sweets:



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You have used 1 of 2 attempts

Correct (1/1 point)

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