Math 145 - Calculus I Name_____

Local Linearity - Day 5 [1]

You work for a company that is ramping up production for a new solar-powered backpack. The total cost C to make x backpacks includes both fixed costs and variable unit costs. The cost to produce the first 300 backpacks is \$13,300, or in other words $C(300) = 13300$.

1. What is the average cost per backpack for the first 300 made? Be sure to include units on your answer.

2. If $C(500) = 20100$, what is the average cost per backpack for the first 500 made? Be sure to include units on your answer.

3. Why do you think the average cost is changing, and how would you expect it to change as the number of backpacks you produce increases?

4. The marginal cost for 300 backpacks (denoted as $C'(300)$) is \$38 per item. Explain why this value is different from the average cost to make 300 backpacks.

5. Use the marginal cost at 300 backpacks to estimate the total cost to make 500 backpacks.

[1] Examples adapted from our textbook.

6. The marginal cost at 500 backpacks is \$30 per backpack. Use $C(500) = 20100$ along with the marginal cost at 500 backpacks to estimate the total cost to make 600 backpacks.

7. Do you think your estimate from question 6. is too high or too low? Why?

8. Use your prediction from question 6. to estimate the average cost to make 600 backpacks.

9. Explain the saying "The average describes the past, the marginal describes the future."