

Second Exam

Wednesday, October 7, 2015

This exam is closed book, but you may use calculators. Make sure your name is on all pages. Show all work, and show it in a logical and organized manner. Each entire problem is worth 25 points. Your work should be on your own paper, and you may keep this exam sheet.

1. Consider the following table of values of the function $y = f(x)$.

x	-0.5	-0.25	0	0.25	0.5
y	0.25	0.0625	0	0.0625	0.25

- (a) Write down approximate values for f' at each of the 5 values of x .
- (b) Based on your values for f' , is f concave up, concave down, or neither?
2. Draw the graph of a function $f(x)$ such that $f(0) = 1$, $f'(0) = 0$, and $f'(x)$ is increasing everywhere.
3. US meat production $M = f(t)$, in millions of metric tons, is a function of t , years since 2000.
- (a) Interpret $f(10) = 92.63$ and $f'(10) = 0.64$ in terms of meat production.
- (b) Estimate $f(15)$ and interpret it in terms of meat production.
4. A company's cost of producing q liters of a chemical is $C(q)$ dollars; this quantity can be sold for $R(q)$ dollars. Suppose $C(2000) = 5930$ and $R(2000) = 7780$. Call the marginal cost MC and the marginal revenue MR .
- (a) What is the profit at a production level of 2000?
- (b) If $MC(2000) = 2.1$ and $MR(2000) = 2.5$, what is the approximate change in profit if q is increased from 2000 to 2001? Should the company increase or decrease production from $q = 2000$?
- (c) On the other hand, if $MC(2000) = 4.77$ and $MR(2000) = 4.32$, should the company increase or decrease production from $q = 2000$? Why?