

MATH 111 B  
Exam I  
October 28, 2010

Name \_\_\_\_\_

Student ID # \_\_\_\_\_

Section \_\_\_\_\_

HONOR STATEMENT

“I affirm that my work upholds the highest standards of honesty and academic integrity at the University of Washington, and that I have neither given nor received any unauthorized assistance on this exam.”

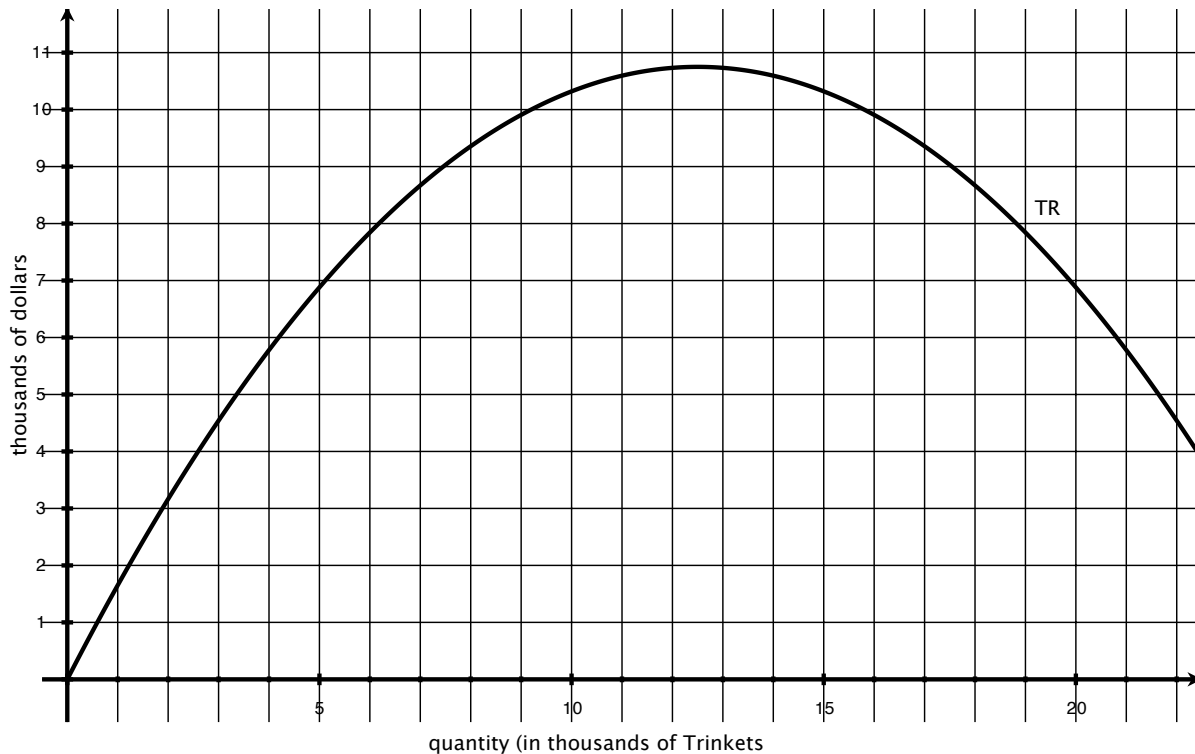
SIGNATURE: \_\_\_\_\_

1	17	
2	15	
3	18	
Total	50	

- Please check that your exam contains 3 problems.
- Turn your cell phone OFF and put it away for the duration of the exam.
- You may not listen to headphones or earbuds during the exam.
- Unless otherwise indicated, you must show your work. Clearly label lines and points that you are using and show all calculations. The correct answer with no supporting work may result in no credit.
- Put your name on your sheet of notes and turn it in with the exam.

GOOD LUCK!

1. (17 points) You sell Trinkets on a sliding price scale. The following shows the graph of total revenue (in thousands of dollars) for selling  $q$  thousand Trinkets.



- (a) If a customer purchases 17 thousand Trinkets, what is the price per Trinket?

ANSWER: \$ \_\_\_\_\_ per Trinket

- (b) Compute the marginal revenue at  $q = 3$  thousand Trinkets. Include units with your answer.

ANSWER: \_\_\_\_\_ UNITS: \_\_\_\_\_

- (c) What is the maximum possible total revenue on an order of Trinkets?

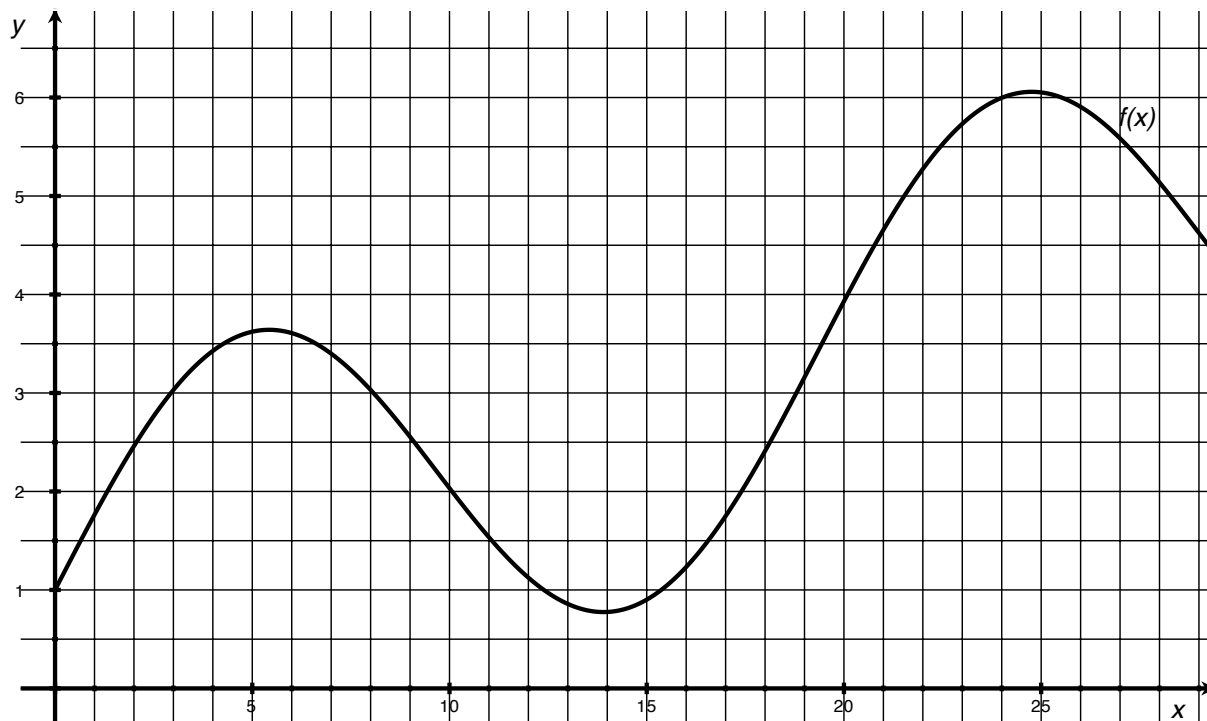
ANSWER: \_\_\_\_\_ thousand dollars

- (d) It costs \$0.50 to produce every Trinket and your fixed costs are \$2000. Sketch and **clearly label** the graph of total cost.

- (e) What quantity yields the maximum profit?

ANSWER:  $q =$  \_\_\_\_\_ thousand Trinkets

2. (15 points) The following is the graph of a function  $f(x)$ .



- (a) Translate the following phrase into functional notation:  
 “the slope of the secant line through the graph of  $f$  at  $x$  and  $x + 0.1$ .”

- (b) Compute the slope of the secant line through  $f(x)$  at  $x = 2$  and  $x = 7$ .

ANSWER: \_\_\_\_\_

- (c) Find a value of  $x$  such that the diagonal line through  $f(x)$  at  $x$  has slope  $\frac{2}{5}$ .

ANSWER:  $x =$  \_\_\_\_\_

- (d) Find the smallest value of  $\frac{f(x)}{x}$ .

ANSWER: \_\_\_\_\_

- (e) Find a value of  $x$  such that  $f(x) - f(15) = 2$ .

ANSWER:  $x =$  \_\_\_\_\_

3. (18 points) The following table gives values of marginal cost and average variable cost for producing Things.

quantity (in Things)	1	2	3	4	5	6	7	8	9	10
$MC$ (in dollars per Thing)	28	19	12	7	4	3	4	7	12	19
$AVC$ (in dollars per Thing)	33.33	28.33	24	20.33	17.33	15	13.33	12.33	12	12.33

- (a) What is the value of variable cost at  $q = 0$ ?

ANSWER: \$ \_\_\_\_\_

- (b) What is the shutdown price?

ANSWER: \$ \_\_\_\_\_ per Thing

- (c) What is the variable cost of producing 6 Things?

ANSWER: \$ \_\_\_\_\_

- (d) Fixed cost is \$400. What is the total cost of producing 3 Things?

ANSWER: \$ \_\_\_\_\_

- (e) Fixed cost is \$400. What is average cost of producing 5 Things?

ANSWER: \$ \_\_\_\_\_ per Thing