

MATH 111
Exam I
October 23, 2008

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.”

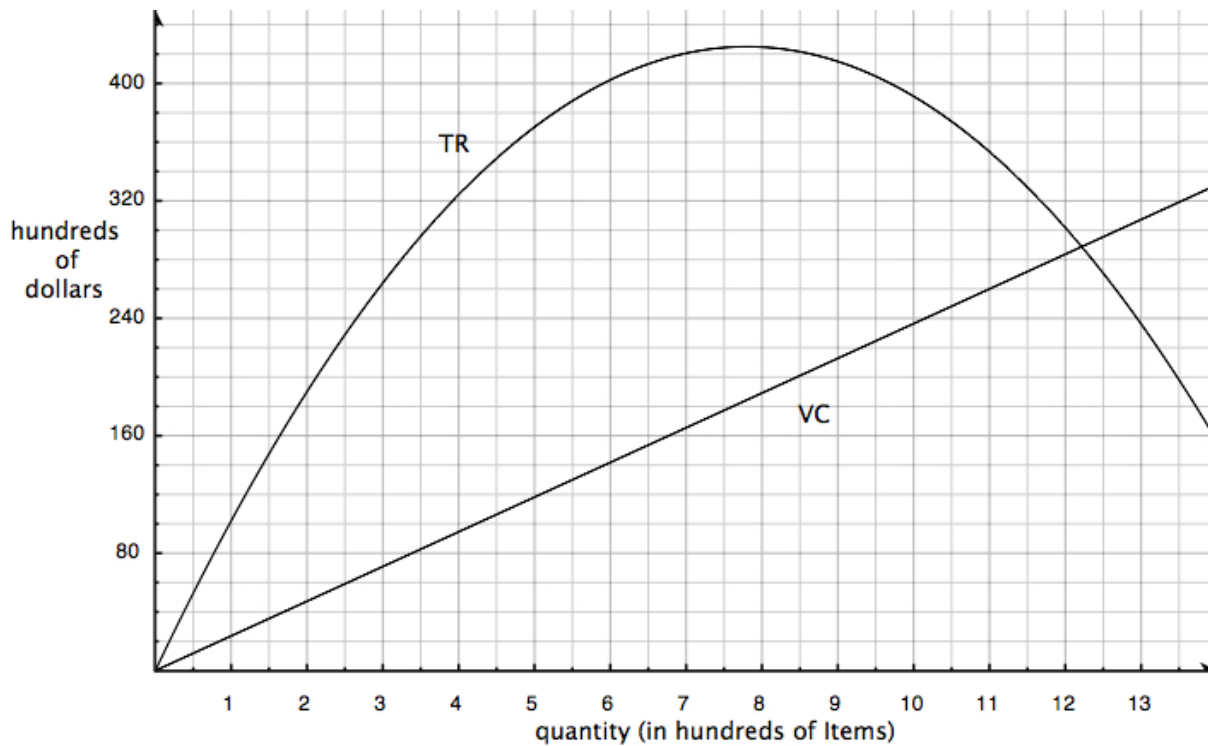
SIGNATURE: _____

1	18	
2	16	
3	16	
Total	50	

- Please check that your exam contains 3 problems.
- Please turn your cell phone OFF and put it away for the duration of 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. (18 points) Below is the graph of **total revenue** and **variable cost** for producing *Items*.



- (a) What is the price per Item on an order of three hundred Items?

ANSWER: \$ _____ per Item

- (b) Approximate the change in TR as quantity changes from 400 Items to 401 Items.

ANSWER: \$ _____

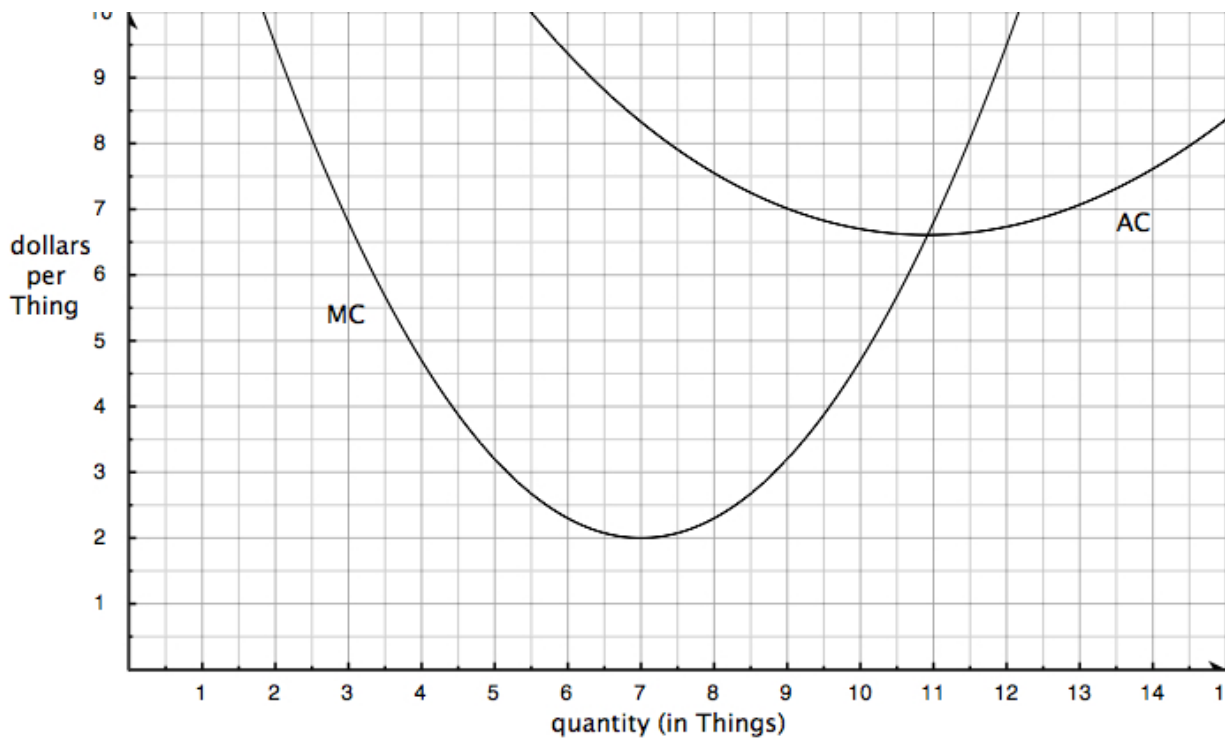
- (c) Fixed costs are \$140. Sketch and label the graph of **total cost**.

- (d) Describe what the graph of **marginal cost** would look like. Be as specific as possible.

- (e) What is the maximum **profit** you can earn on a single order of Items? (Include units in your answer.)

ANSWER: _____ UNITS: _____

2. (16 points) Below is the graph of **marginal cost** and **average cost** for producing *Things*.



(a) What is the smallest value of marginal cost?

ANSWER: \$ _____ per Thing

(b) What is the breakeven price?

ANSWER: \$ _____ per Thing

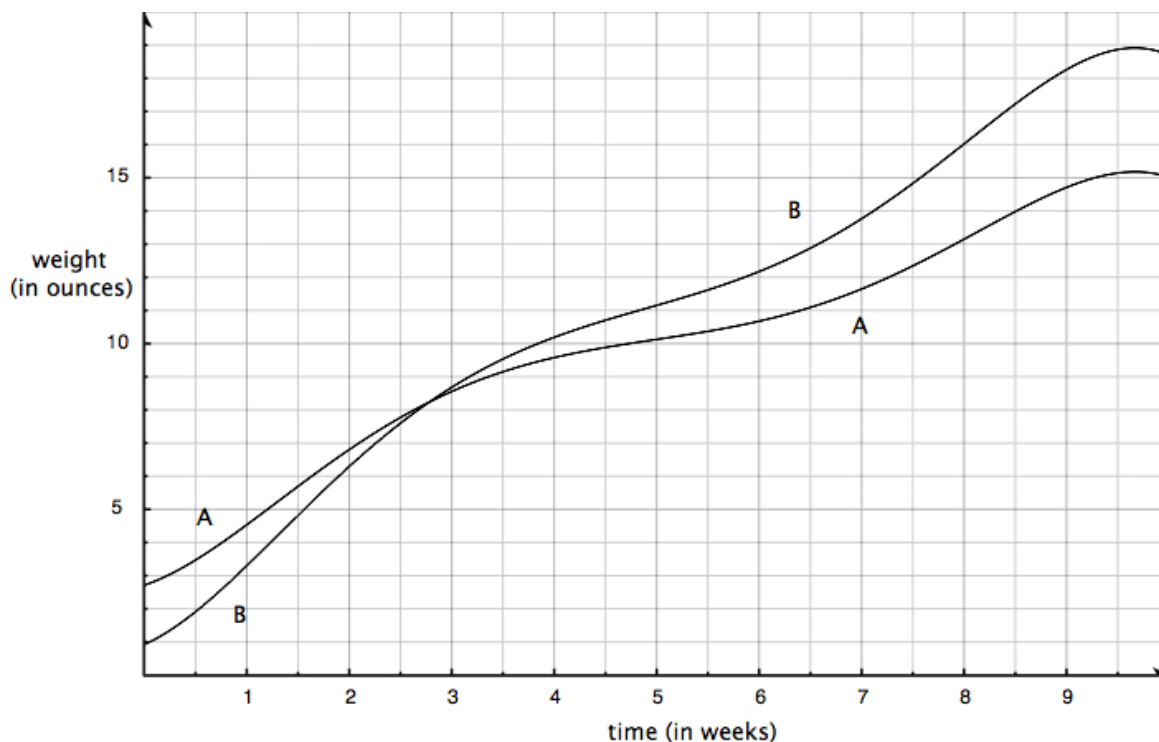
(c) What is the **total cost** to produce 7 Things?

ANSWER: \$ _____

(d) Suppose the market price for selling Things is \$5.50 per Thing. How many Things should you sell in order to maximize **profit**? (Your answer should be a **whole number** of Things.)

ANSWER: _____ Things

3. (16 points) Below is the graph of the weight of two Chihuahua puppies over a ten-week period.



- (a) Let $A(t)$ represent the weight of puppy A at time t weeks and $B(t)$ represent the weight of puppy B at time t weeks. Translate the following into functional notation.
- the amount of weight gained by puppy A during the first 5 weeks
 - the incremental average rate of change of the weight of puppy B during the h -week period beginning at time t
- (b) Find a time at which the overall rate of change of the weight of puppy B is 2 ounces per week.
- ANSWER: $t =$ _____ weeks
- (c) Find a time at which puppy B weighs exactly three ounces more than puppy A .
- ANSWER: $t =$ _____ weeks
- (d) Which of the following describes the graph of $\frac{B(t+0.5) - B(t)}{0.5}$ from $t = 1$ to $t = 8$?
- It is always increasing.
 - It is always decreasing.
 - It decreases and then increases.
 - It increases and then decreases.
 - None of the above.

ANSWER: (circle one) i ii iii iv v