

MATH 111 C  
Exam I  
October 27, 2011

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.”

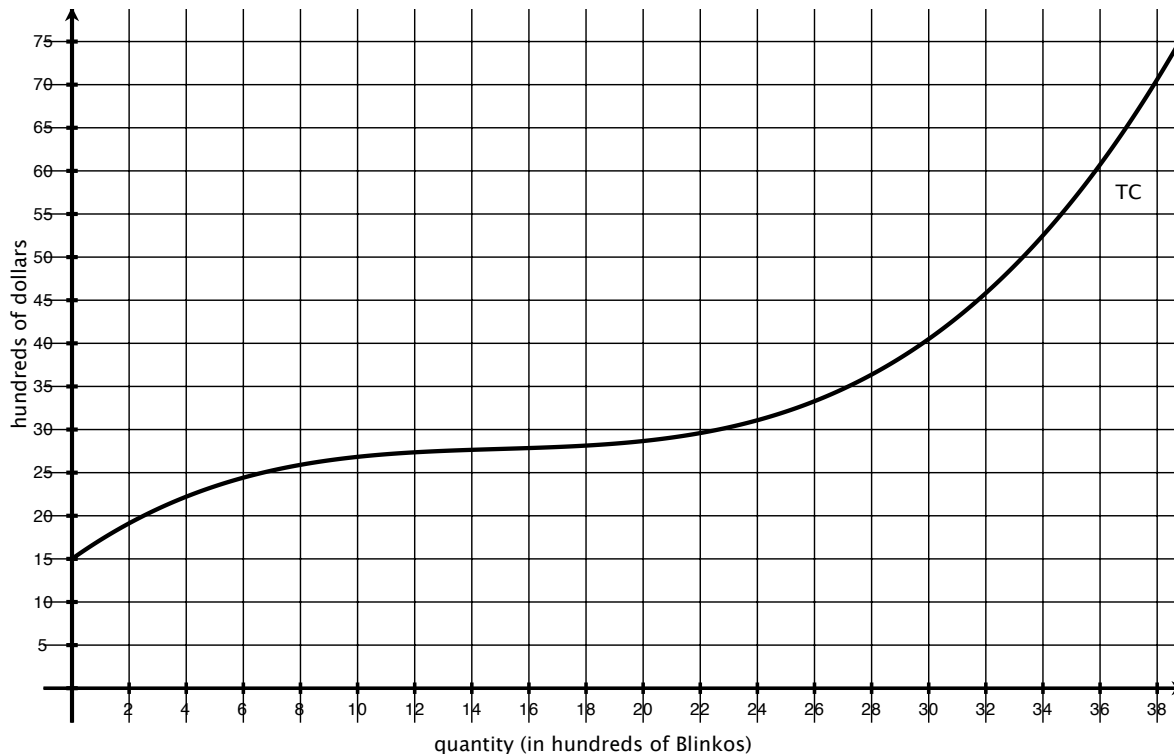
SIGNATURE: \_\_\_\_\_

1	19	
2	15	
3	16	
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.
- There are multiple versions of the exam, you have signed an honor statement, and cheating is a hassle for everyone involved. DO NOT CHEAT.
- Put your name on your sheet of notes and turn it in with the exam.

GOOD LUCK!

1. (19 points) You produce and sell Blinkos. The following shows the graph of total cost in hundreds of dollars for selling  $q$  hundred Blinkos.



- (a) Compute variable cost at  $q = 16$  hundred Blinkos.

ANSWER: \_\_\_\_\_ hundred dollars

- (b) Compute the change in  $TC$  that occurs if production increases from 3600 Blinkos to 3601 Blinkos. Include units with your answer.

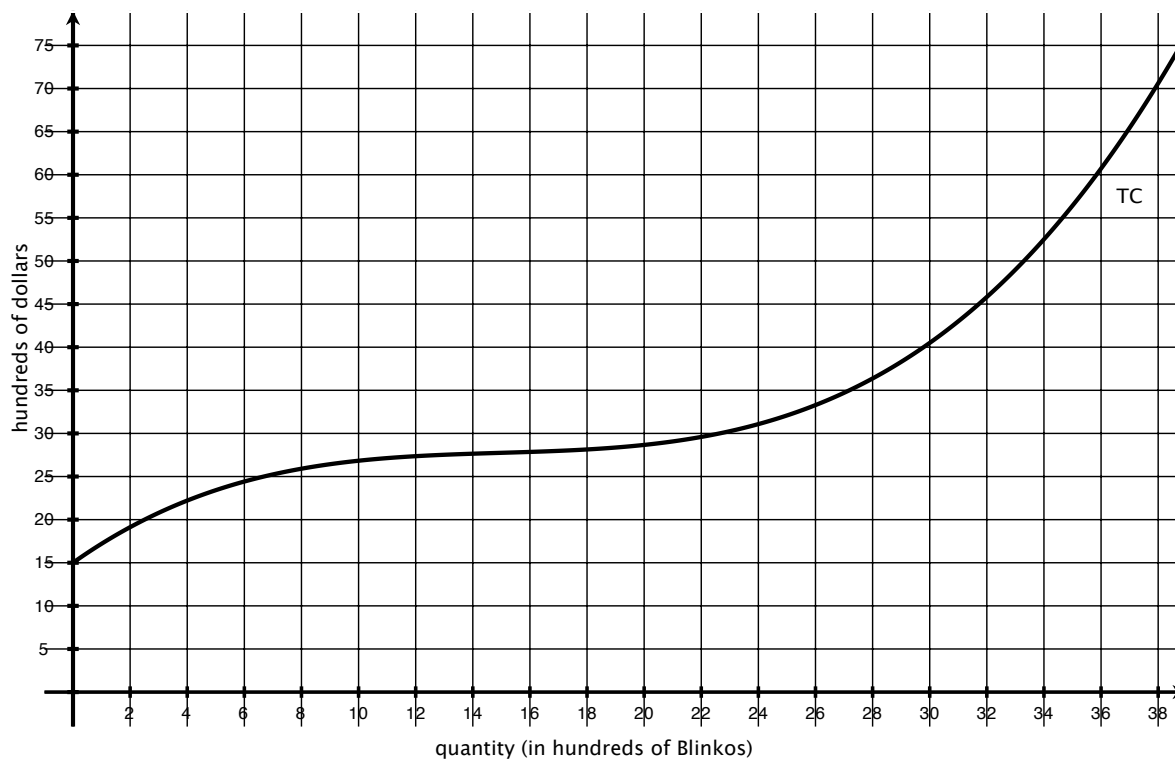
ANSWER: \_\_\_\_\_; UNITS: \_\_\_\_\_

- (c) Fill in the blanks:

If the market price for selling Blinkos is between \$ \_\_\_\_\_ per Blinko and \$ \_\_\_\_\_ per Blinko, then you cannot make a (positive) profit but you should not shut down.

(THIS PROBLEM CONTINUES ON THE NEXT PAGE.)

Here is the graph of  $TC$  again.



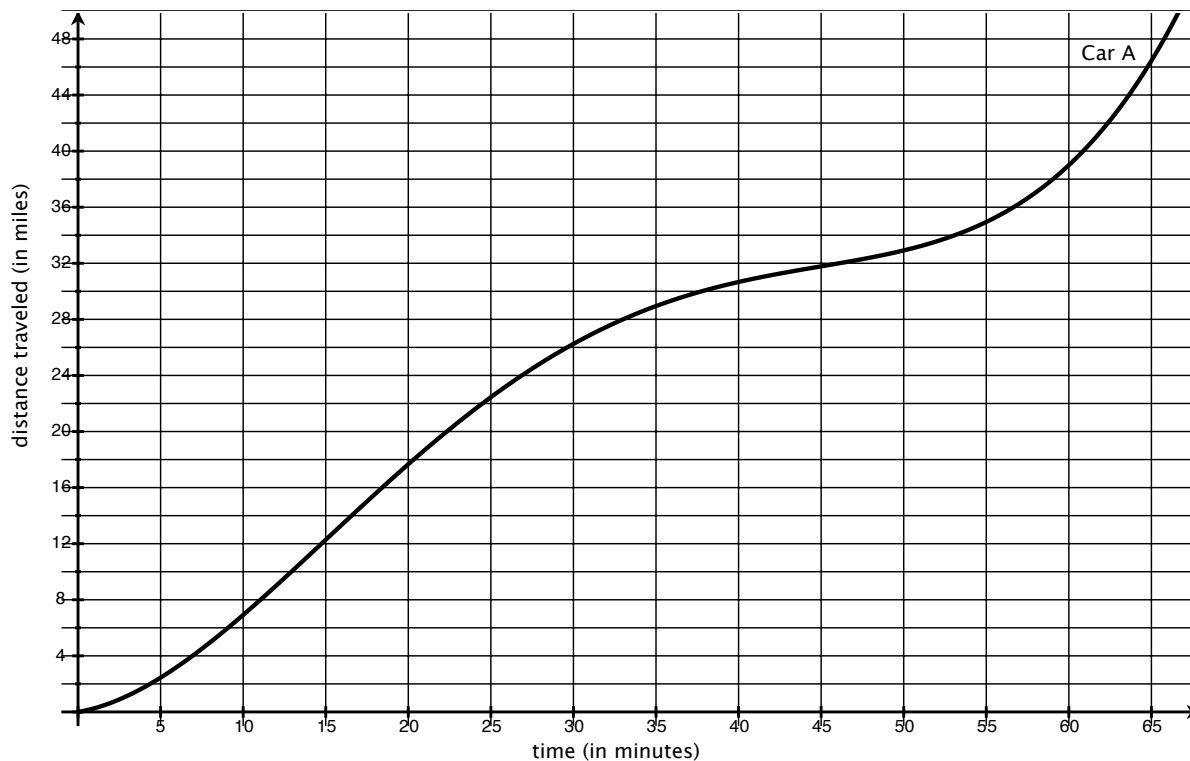
(d) At what quantity is average cost \$3.50 per Blinko?

ANSWER:  $q =$  \_\_\_\_\_ hundred Blinkos

(e) You sell Blinkos for \$2 each. What is the largest possible profit you can earn on an order of Blinkos?

ANSWER: \_\_\_\_\_ hundred dollars

2. (15 points) The following is the graph of distance traveled versus time for Car A.



- (a) Compute Car A's average speed during the 10-minute interval beginning at  $t = 40$  minutes.

ANSWER: \_\_\_\_\_ miles per minute

- (b) Find the highest value of Car A's average trip speed.

ANSWER: \_\_\_\_\_ miles per minute

- (c) A second car, Car B, is next to Car A at  $t = 0$  and travels 8 miles every 10 minutes. Give the longest time interval during which Car A is ahead of Car B.

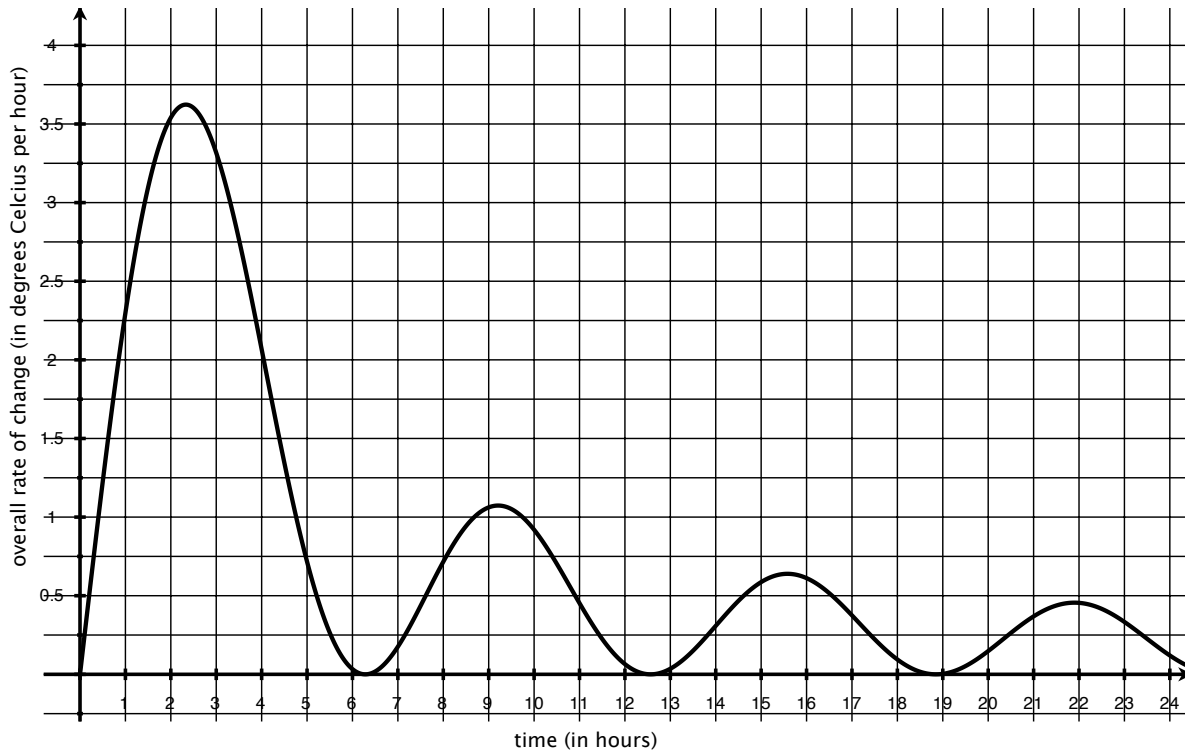
ANSWER: from  $t =$  \_\_\_\_\_ to  $t =$  \_\_\_\_\_ minutes

- (d) Give a 5-minute interval during which both cars have the same average speed and Car B is ahead of Car A.

ANSWER: from  $t =$  \_\_\_\_\_ to  $t =$  \_\_\_\_\_ minutes

3. (16 points) The temperature in a certain location rises and falls during a 24-hour period. Let  $P(t)$  represent the temperature in degrees Celcius at time  $t$ . You know that the temperature at  $t = 0$  was 0 degrees, which means that the graph of  $P(t)$  goes through the origin.

The following graph is the graph of **overall rate of change of temperature**. That is, this is the graph of  $\frac{P(t)}{t}$ .



- (a) Name all times at which the overall rate of change of temperature is 1 degree per hour.

ANSWER: (list all)  $t =$  \_\_\_\_\_

- (b) What is the temperature the first time the overall rate of change is 2.5 degrees per hour?

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

- (c) Does the temperature rise or fall from  $t = 4$  to  $t = 9$ ? Justify your answer.

ANSWER: The temperature (circle one) rises      falls.

- (d) Translate the following into functional notation:

The temperature rises, on average, 0.5 degrees per hour during the  $h$ -minute interval beginning at time  $t$ .