MATH 111
Exam I
Winter 2016

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	12	
2	18	
3	9	
4	11	
Total	50	

- Check that your exam contains 4 problems.

- You are allowed to use a TI 30X-IIS calculator, a ruler, and one sheet of hand-written notes. All other sources are forbidden.

- Do not use scratch paper. If you need more room, use the back of the page and indicate to the grader you have done so.

- 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.

- 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.

- If you use a guess-and-check method when an algebraic method is available, you may not receive full credit.

- When rounding is necessary, you may round your final answer to two digits after the decimal.

- 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. (12 points) The graph below shows distance traveled vs. time for a car on a long, straight road.
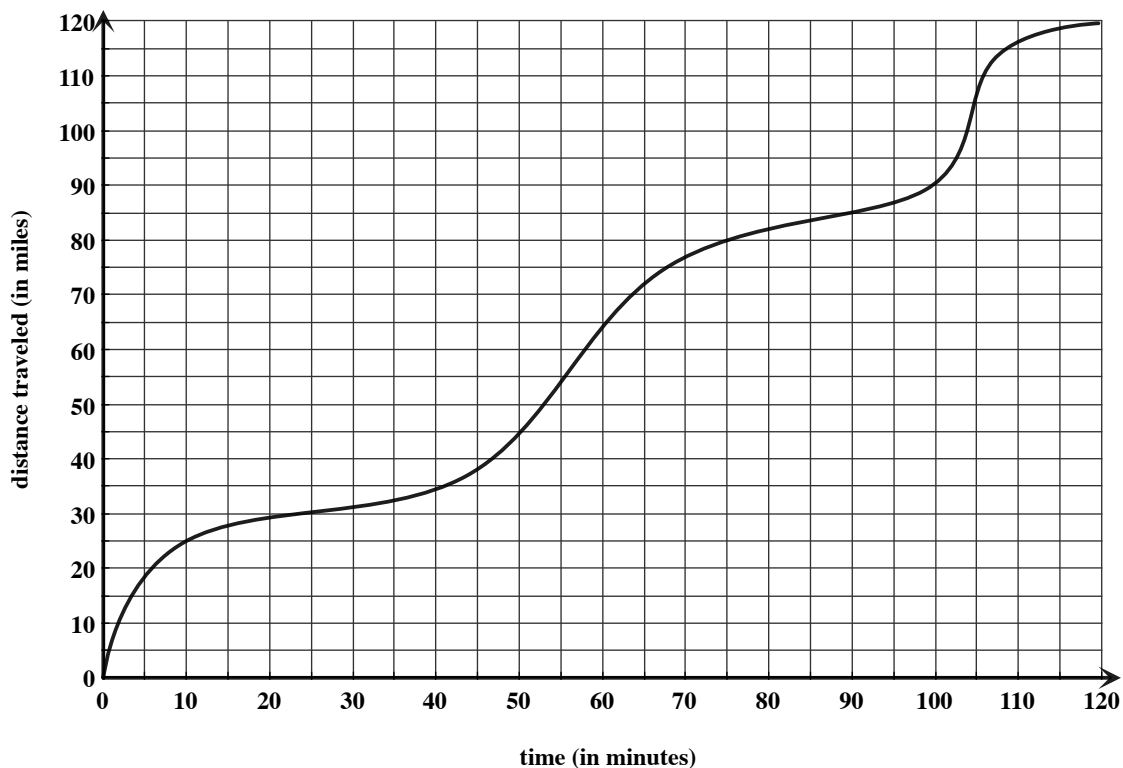
(a) Find the average speed of the car from $t = 70$ to $t = 75$.

ANSWER: _____miles per minute

(b) Find the first time at which the car's average trip speed is 1 mile per minute.
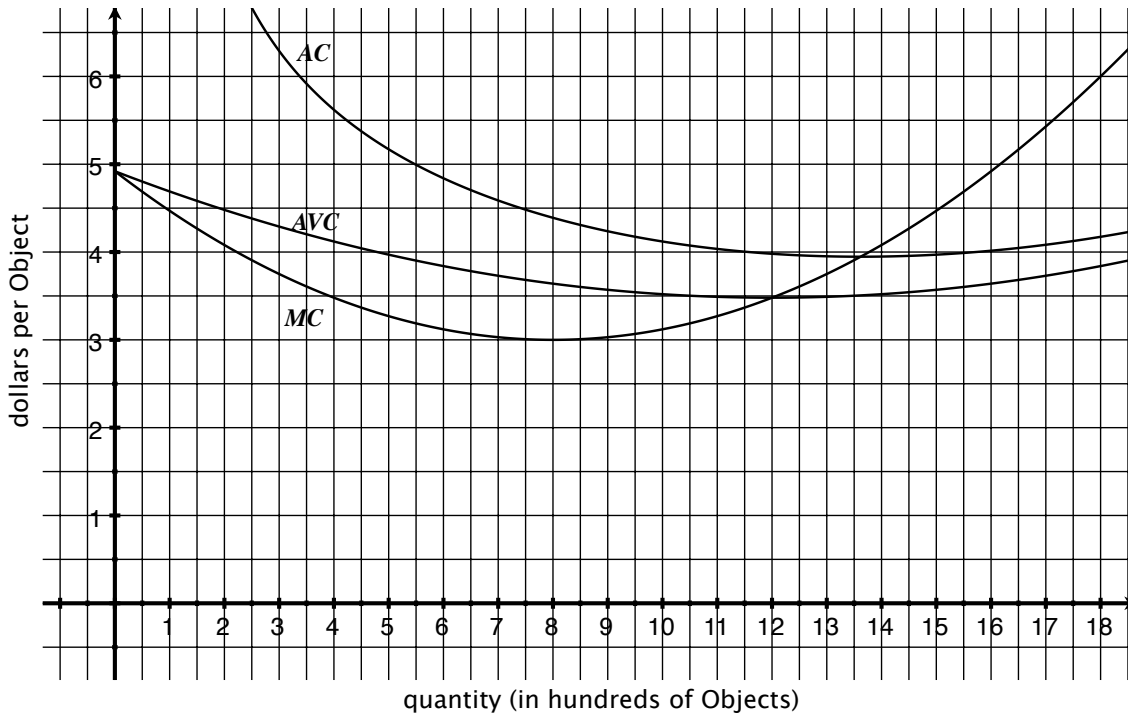
ANSWER: $t =$_____minutes

(c) What is the lowest value of average trip speed?

ANSWER: _____miles per minute

(d) The car travels 10 miles from $t = 90$ to $t = 90 + h$. What is the value of h?

ANSWER: $h =$_____

2. (18 points) The graph below shows marginal cost (MC), average cost (AC), and average variable cost (AVC) for producing Objects.

(a) Find the shutdown price and break-even price.

ANSWERS: shutdown price = _____dollars per Object

break-even price = _____dollars per Object

(b) How much will total cost increase if production increases from 200 to 201 Objects?

ANSWER: _____dollars

(c) Compute each of the following:

   i. $TC(4)$

ANSWER: $TC(4) =$_____hundred dollars

   ii. $VC(4)$

ANSWER: $VC(4) =$ _____hundred dollars
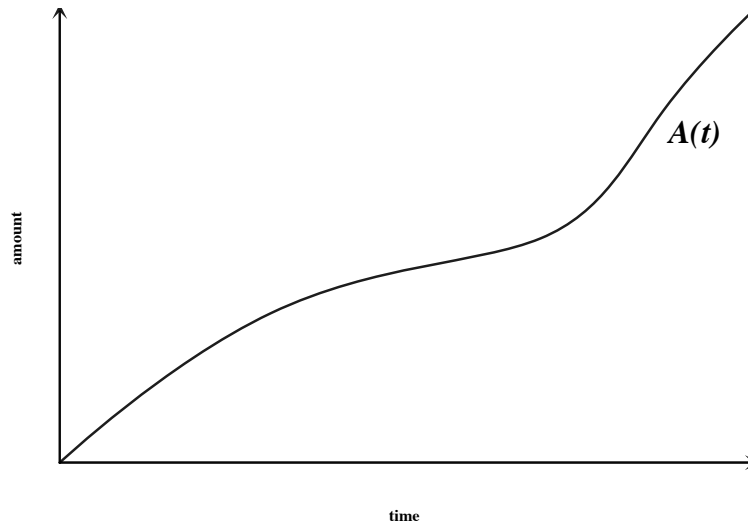
   iii. FC

ANSWER: $FC =$_____hundred dollars

(d) If you sell each Object for $6, what is the maximum possible profit?

ANSWER: _____hundred dollars

3. (9 points) Water flows into a reservoir. The the water level (the amount of water in the reservoir) at time t hours is given by the function $A(t)$. The graph of $A(t)$ is shown below. Note that the graph goes through the origin.

Translate into the indicated "language."

(a) the incremental rate of change in the water level from $t = 1$ to $t = b$

Translate into functional notation:

(b) the slope of the diagonal line through the graph of $A(t)$ at $t = 21$

Translate into English:

(c) $\dfrac{A(5 + h) - A(5)}{h}$

Translate into graphical language:

4. (11 points)

    (a) Solve for x:

$$4x + 2 - \frac{(5x + 10)}{3} > \frac{x}{7}.$$

    (b) The supply and demand curves for a certain market are given by the following:

$$\text{supply}: \ p = 5q + 162 \qquad \text{demand}: \ p = -3q + 946.$$

    Find the equilibrium price and quantity.

ANSWER: $q = $_____ $p = $_____