

NAME: \_\_\_\_\_

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

QUIZ SECTION: \_\_\_\_\_

**Math 111**  
**Midterm I**  
January 30<sup>th</sup>, 2007

Problem 1	4	
Problem 2	6	
Problem 3	20	
Problem 4	20	
<b>Total:</b>	<b>50</b>	

- You are allowed to use a calculator, a ruler, and one sheet of notes.
- Your exam should contain 5 pages in total and 4 problems. Check that your exam is complete!
- You **must explain how you get your answers**. Correct (or incorrect) answers with no supporting work may result in little or no credit. **On problems in which you use a graph, draw any lines you use, label them, and mark points clearly.**
- Write your **final answers in the indicated spaces**.
- If you need more room, use the backs of pages and indicate to the reader that you have done so.
- Raise your hand if you have a question.

GOOD LUCK!

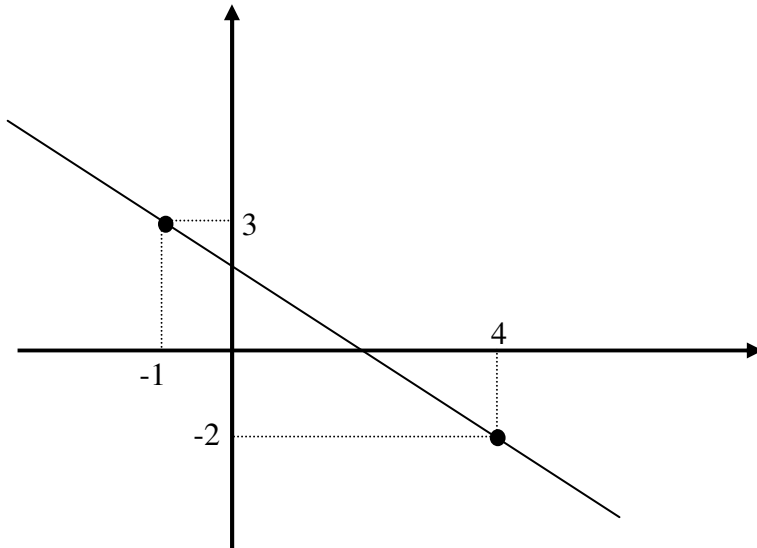
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*Do you want me to post your grade so far on the class website under the last 4 digits of your student number?*

*Yes, please post my grade. Sign to give permission:* \_\_\_\_\_

*No, please don't post my grade so far.*

**1 (4 points)** Find the equation of the line whose graph is shown below. Put it in the form  $y=mx+b$ , where  $m$  and  $b$  are numbers.



Answer:  $y = \underline{\hspace{2cm}}$ .

**2 (6 points)**

Let  $D(t)$  denote the distance (in **miles**) traveled by a car along a straight road up to time  $t$  (in **hours**), starting from the car's initial position (i.e.  $D(0)=0$ ).

a. Translate the following statement into **English** (including the appropriate units):

$$\frac{D(5) - D(2)}{3} = 50.$$

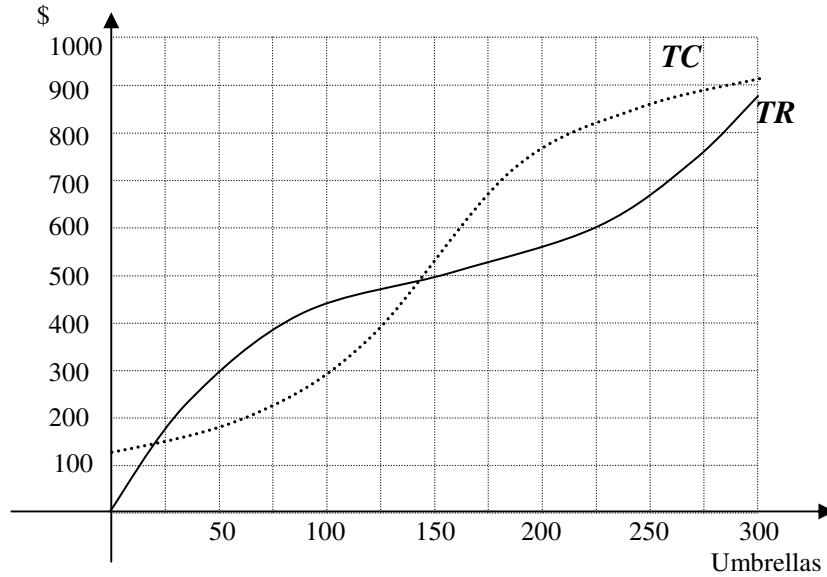
Answer:

b. Translate the following statement into **functional notation**:

“The car traveled 70 miles in the first 90 **minutes**”

Answer:

**3 (20 points)** The following are the graphs of the total cost (**TC**) and total revenue (**TR**), in dollars, for the Seattle Rain Company, which is producing and selling Umbrellas.



a) What is the change in the total revenue if you sell 51 Umbrellas instead of 50 Umbrellas?

Work:

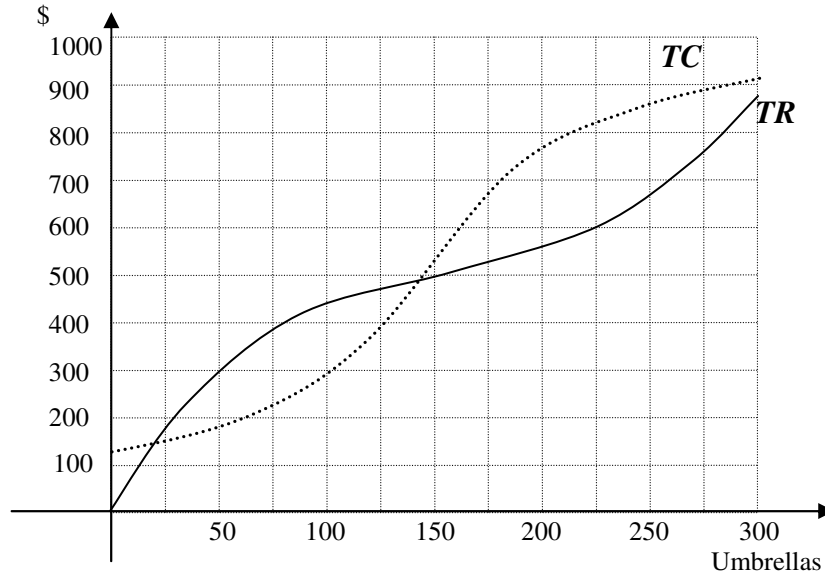
Answer: \_\_\_\_\_ dollars.

b) At what quantity  $q$  of Umbrellas is the average revenue (AR) equal to \$ 4.50 per Umbrella?

Work:

Answer: At  $q =$  \_\_\_\_\_ Umbrellas.

The following questions continue the problem from the previous page. For your convenience, here are the same graphs again.



c) Compute the average variable cost (AVC) of producing 125 Umbrellas.

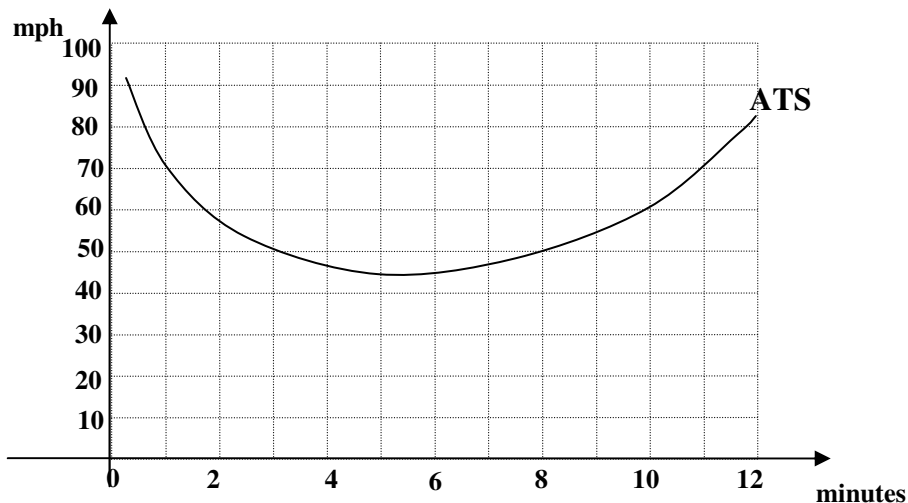
Answer:  $AVC(125) =$  \_\_\_\_\_ Units: \_\_\_\_\_

d) What is the maximum profit, and at what quantity of Umbrellas produced and sold is it achieved?

Work:

Answer: the maximum profit is \_\_\_\_\_ dollars, at  $q =$  \_\_\_\_\_ Umbrellas.

**4 (20 points)** The graph below is of the average trip speed (ATS) for a car, in miles per hour, over a 12 minute period.



a) Find the first time  $t$  when the average trip speed of the car is 70 mph.

Work:

Answer: At  $t =$  \_\_\_\_\_ minutes.

b) How far has the car traveled in the first 8 minutes?

Work:

Answer: \_\_\_\_\_ miles.

c) How far did the car travel from  $t = 3$  to  $t = 8$  minutes?

Work:

Answer: \_\_\_\_\_ miles .

d) What was the car's average speed from  $t = 3$  to  $t = 8$  minutes?

Work:

Answer: AS = \_\_\_\_\_ mph.

e) Find a three-minute time interval over which the ATS increased by 10 mph.

Work:

Answer: from  $t =$  \_\_\_\_\_ to  $t =$  \_\_\_\_\_ minutes.