

NAME: _____

Student ID #: _____

QUIZ SECTION: _____

Math 111
Midterm I
October 18th, 2007

Problem 1	4	
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Total:	50	

- You are allowed to use a calculator, a ruler, and one double-sided sheet of notes.
- Your exam should contain 5 pages in total and 4 problems. Check that your test is complete!
- You **must indicate how you get your answers**. Correct (or incorrect) answers with no justification 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 answer 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!

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

Yes, please post my grades. Sign to give permission: _____

No, please don't post my grades so far.

1 (4 points) Find both coordinates of the vertex for the graph of the following quadratic function:

$$y = f(x) = -5x^2 - 8x + 17$$

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

2 (8 points) Let $D(t)$ represent the distance traveled by a bicycle (in **kilometers**), up to time t (in **hours**), starting from the bike's initial position (that is, $D(0)=0$).

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

$$\frac{D(2)}{2} = 18.$$

Answer:

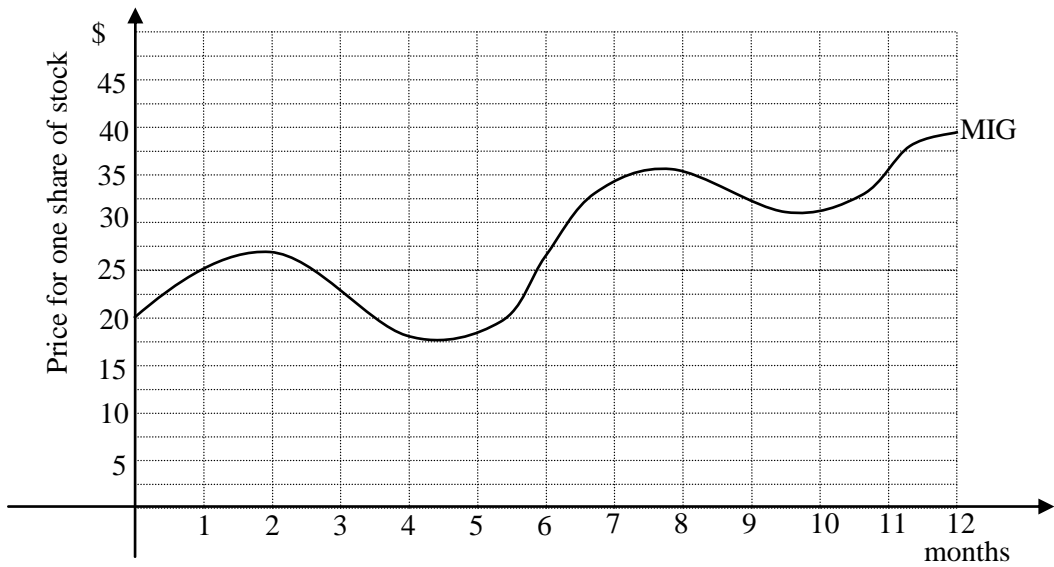
b) Translate the following statement into **functional notation**:

“The bike traveled 15 kilometers from 1 hour to 2 hours”

Answer:

3 (10 points)

The graph below shows the stock price (in \$) for one share of a company named MathIsGreat (MIG), over the course of 12 months. Note that the initial price for one share of this stock was \$20.



- a) What was the average rate of change of the stock price over the first 6 months? (include correct units)

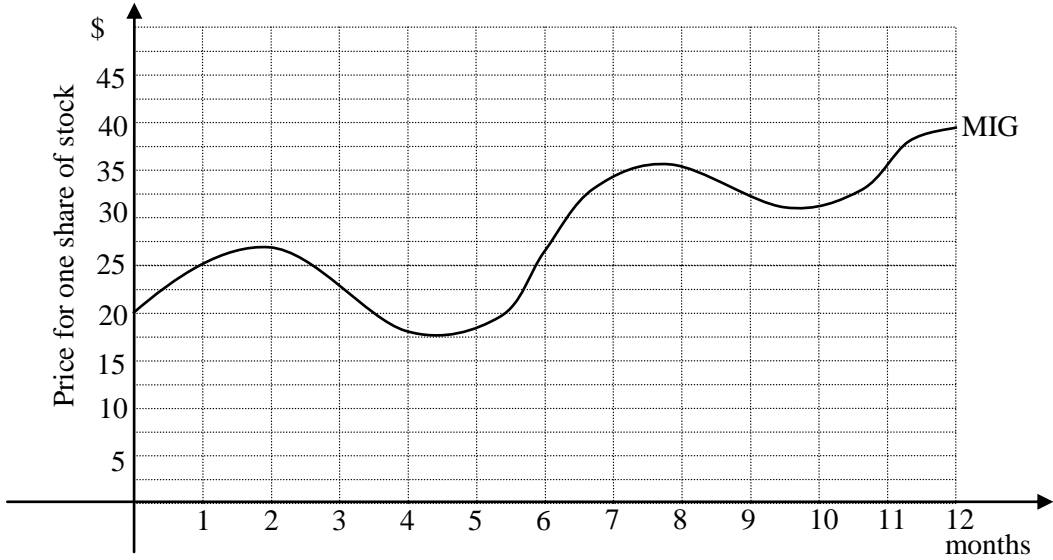
Answer: Rate: _____ Units: _____

- b) Find a 2-month time interval, if any exists, over which the price of one share of MIG increased by \$10.

Answer: from $t =$ _____ to $t =$ _____ months
(these times need not be whole numbers of months)

4 (12 points)

The following is the same graph as in the previous problem, and recall that it shows the stock price (in \$) for one share of a company named MathIsGreat (MIG), over the course of 12 months.



- a) Suppose another stock, TimeIsMoney (TIM), starts off at \$10 per share at $t=0$, and its share price increases by \$2.50 every month. On the axes above, draw the graph for TIM's share price for the 12-month period.

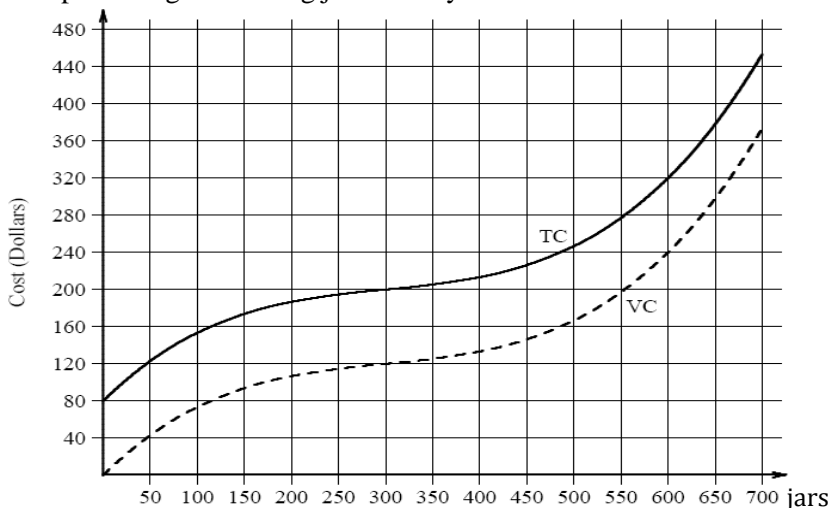
- b) Find **all times** t when MIG's share price is \$5 higher than TIM's.

Answer: At $t =$ _____ months (*list all*).
 (*answers need not be a whole number of months*)

- c) Find the greatest price difference between the share prices of the two stocks during the 12-month period.

Answer: \$ _____.

5 (16 points) The graphs below represent the Total Cost (TC), and the Variable Cost (VC), for the Hungry Baby Company, which is producing and selling jars of baby food.



a) Compute the Marginal Cost for producing the 201st jar.

Answer: $MC(200) = \underline{\hspace{2cm}}$ dollars.

b) Compute the Average Cost for producing 200 jars. Include correct units.

Answer: $AC(200) = \underline{\hspace{2cm}}$ Units: $\underline{\hspace{2cm}}$.

c) Find a range of quantities, if any exist, over which the Marginal Cost is increasing, but the Average Cost is decreasing.

Answer: From $q = \underline{\hspace{2cm}}$ to $q = \underline{\hspace{2cm}}$ jars.

d) Find the shutdown price.

Answer: $SDP = \underline{\hspace{2cm}}$ \$ per jar.