Math 111 Winter 2018, Midterm I

January 30, 2018

**Name**_____

TA/Section_____

Instructions.

- There are 4 questions. The exam is out of 40 points.

- You are allowed to use one page of notes written only on one side of the sheet in your own handwriting. It has to be the original and not a photocopy. **Hand in your notes with your exam paper.**

- You may only use a TI 30X IIS calculator.

- Round your final answers to two digits after the decimal.

- **Show your work**. If I cannot read or follow your work, I cannot grade it. You may not get full credit for a right answer if your answer is not justified by your work.

Copying from someone elses paper, using notes (unless expressly allowed by the teacher), altering an exam for re-grading, getting an advance copy of the examination, or hiring a surrogate test-taker are all flagrant violations of University policy.

*Source: Student Academic Responsibility, University of Washington*

Question	points
1	
2	
3	
4	
Total	

1. The following shows the total cost of producing Cups. Mark the lines on your graph with the related question part for grading. Include units with your answers.

Total Cost of Producing Cups
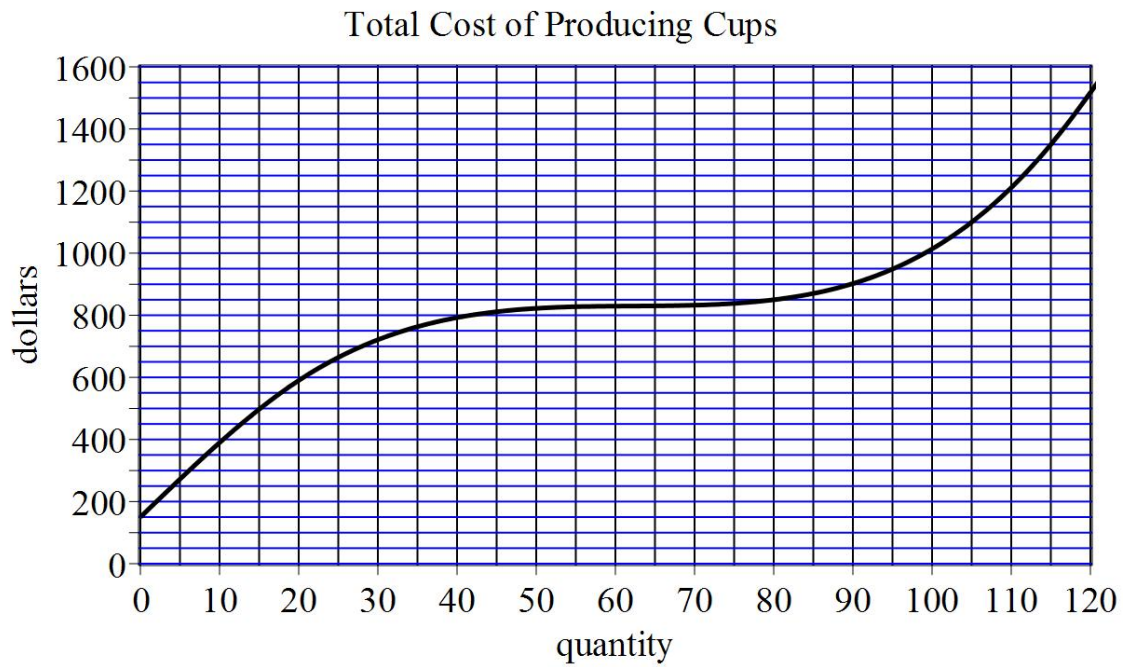
(a) (2 points) Find the variable cost of producing 55 Cups.

(b) (2 points) Approximate the cost of producing the 21st Cup.

(c) (2 points) If you sell each Cup for $12.50, when do you break even?

(d) (4 points) What is your maximum profit?

2. The following graph shows the stock price of Yangtze Inc. over the year 1999. Mark the lines on your graph with the related question part for grading. Include units with your answers.

Stock Price of YNGTZ
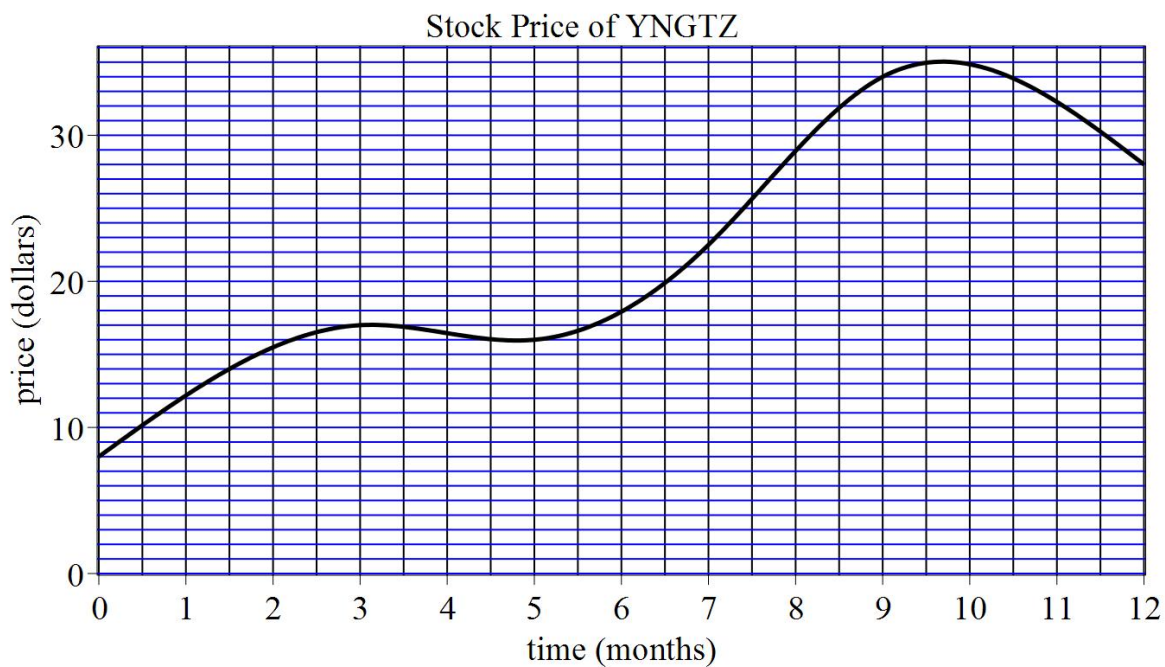
(a) (2 points) Find the average rate of change in the stock price during the 5 month period starting mid-year.

(b) (3 points) Approximate the change in the stock price during the last 2 days of April.

(c) (2 points) Find two 3 month periods where the stock price increased by 3 dollars.

(d) (3 points) Suppose the price of Ganges Inc. starts at 5 dollars and increases at a constant rate of 2 dollars per month. Find the times when the stocks have the same overall rate of change.

3. The following are graphs of **Average Cost** (dash), **Marginal Cost** (solid) and **Marginal Revenue** (dotted) for producing and selling Books. Include **units** with your answers.

AC, MR and MC Graphs for Producing Books
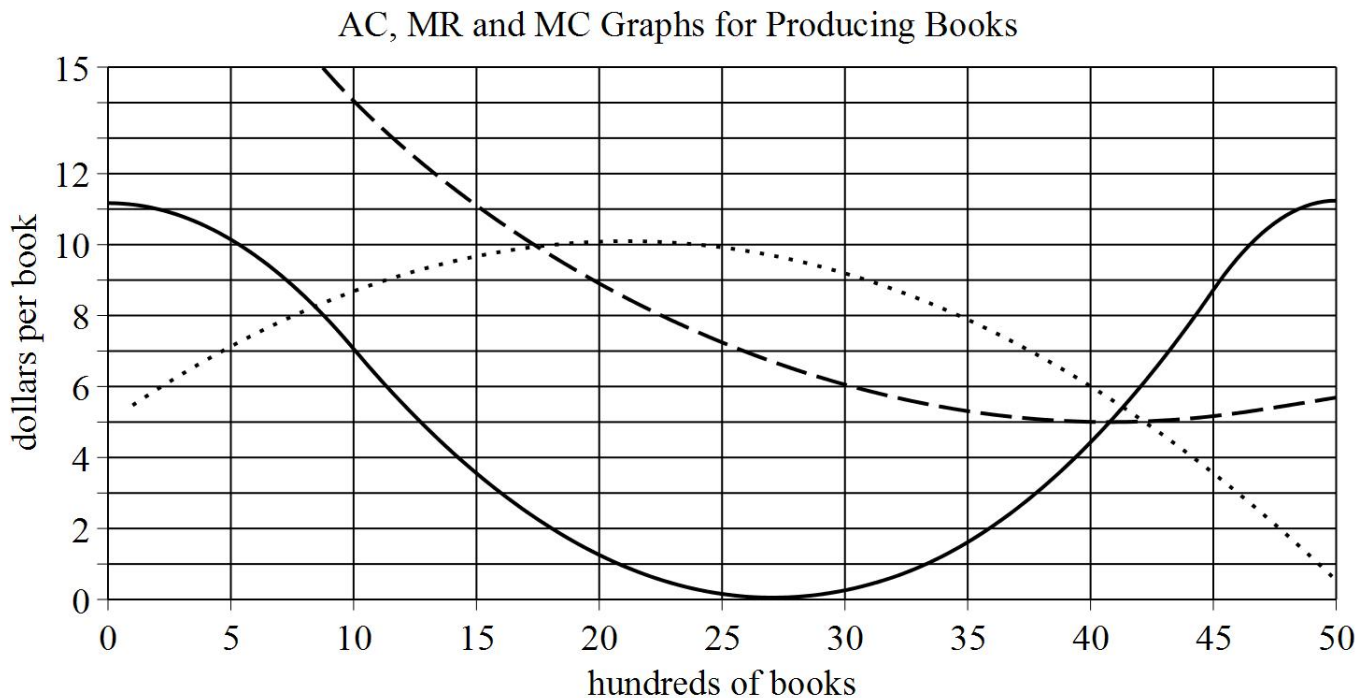
(a) (2 points) Approximate the cost of producing the 2001st book.

(b) (2 points) Approximate the revenue from the sale of the 1501st book.

(c) (2 points) Fixed costs are $4250. Approximate the variable cost of producing 3000 books.

(d) (2 points) Which one can your read from the graph: The breakeven price or the shutdown price? What is its value?

(e) (2 points) What quantity will maximize the profit?

4. The total cost and total revenue for producing and selling Things are both given by **linear** functions.

   (a) (4 points) It costs 40 dollars to produce 40 Things and 60 dollars to produce 100 Things. Write $TC(x)$ in the form $mx + b$ where x represents the quantity of Things. The units for TC must be in dollars.

   (b) (1 point) You sell each Things for 70 cents.Write $TR(x)$ in the form $mx + b$ where x represents the quantity of Things. The units TR must be in dollars.

   (c) (2 points) When do you break even?

   (d) (3 points) What are the Fixed Cost, Marginal Cost and Marginal Revenue?

$$FC = \qquad\qquad MC = \qquad\qquad MR =$$