

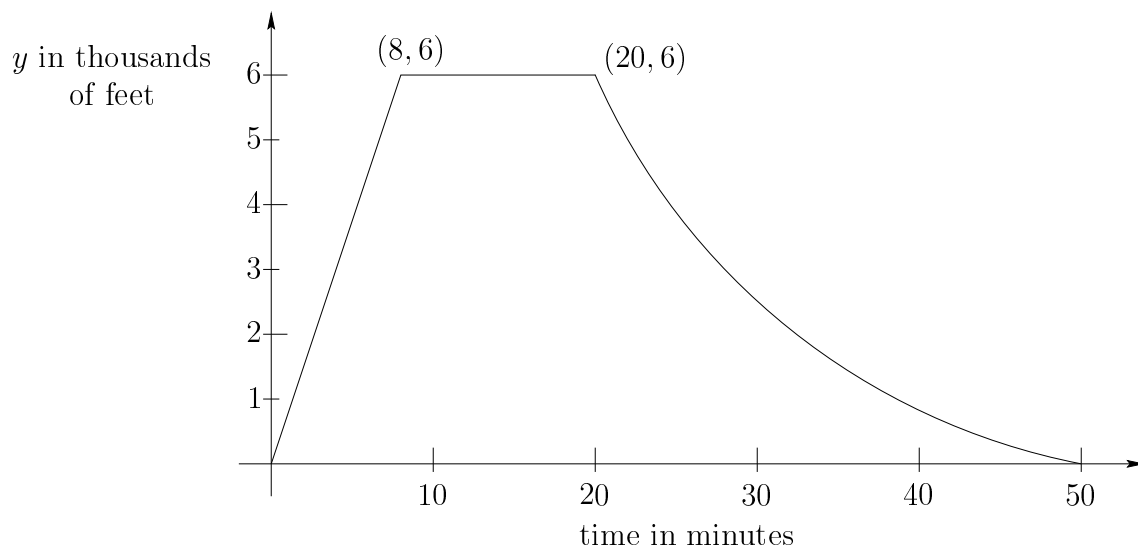
Math 120
Autumn 1999
Quiz 3

Name: _____

Instructions:

- You will have 30 minutes.
- Closed book, but you are allowed one page of notes (both sides) in your own handwriting.
- You must SHOW YOUR WORK to receive credit.
- Give exact answers to all problems. For example, if the answer to a problem is $\frac{1}{3}$ or $\sqrt{2}$, do not write .33 or 1.414, etc. If you wish to give a decimal approximation after your exact answer, that's okay.
- The point value of each problem is shown in parentheses to the left.

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1. An airplane takes off from Boeing Field and its altitude (height above ground) is shown in the graph below. The portion of the graph between 20 and 50 minutes is one quarter of the ellipse $\left(\frac{t-50}{30}\right)^2 + \left(\frac{y-6}{6}\right)^2 = 1$



- (3) (a) Find formulas, in terms of time t , for the altitude $A(t)$ during the first 8 minutes, the time interval between 8 and 20 minutes, and the last 30 minutes.

(4) (b) Write a multipart function which gives the altitude as a function of time during the entire flight.

(4) (c) How long did the plane spend below 4000 feet?

(3) (d) What was the average rate of change in the altitude between 18 and 25 minutes? What are the units?

2. For this problem the function f is defined by

$$f(x) = \frac{x}{1-x}.$$

(2) (a) Find the domain of f .

(4) (b) Find $\frac{f(3+u) - f(3)}{u}$. Simplify your answer so that only one fraction bar appears in your answer.