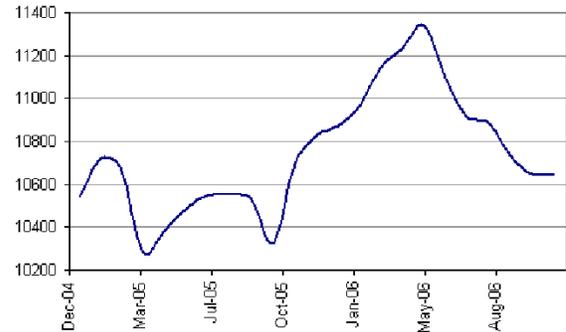


Math 135, section F2, summer 2006

Entrance questions

1. A sign at the track near the Werblin recreation center declares that 9 laps is 4 miles. What is the length in miles of 7 laps?

2. This graph to the right is taken from a webpage of the Financial Forecast Center. It records and predicts the Dow Jones Industrial Average (DJIA) for the period indicated.*



a) What is the (approximate) highest value of the DJIA shown? What date does it occur on? Also answer the corresponding questions for the lowest value.

b) What (approximately) is the length of the longest period of time shown when the DJIA seems to be increasing? What are the beginning values (date, DJIA amount) and ending values for this period of time?

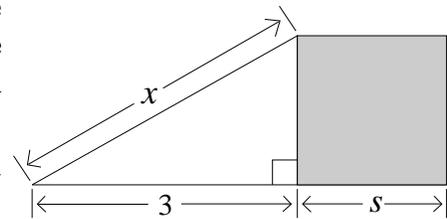
3. The Body Mass Index (BMI) is computed by taking a person's weight (in kilograms), and dividing by the person's height (in meters) squared.

a) Write a formula for BMI using the variables W for weight and H for height. Your formula should begin $BMI(W, H) = \dots$

b) Describe how the BMI changes if weight increases and height stays the same. What happens exactly to BMI if the weight is doubled and the height is fixed? Verify your assertion algebraically.

c) Describe how the BMI changes if height increases and weight stays the same. What happens exactly to BMI if the height is doubled and the weight is fixed? Verify your assertion algebraically.

4. A right triangle and a square share sides, as shown in the diagram to the right. The hypotenuse of the right triangle has length x , and one "leg" of triangle (not shared with the square) has length 3.



a) What is the side length, s , of the square? (Find this by computing the length of the other leg of the triangle.)

b) What is the area of the square? What is the area of the triangle?

c) Define a function, $f(x)$, to be the sum of the areas of the square and the triangle. Write an algebraic formula for $f(x)$. What is the "natural domain" of this function?

d) Find x so that the sums of the areas of the square and rectangle is 7. (One way is to write $f(x)$ in terms of s , find s so that the total area is 7, and then compute x .)

* The graph was copied on 6/22/2006 from <http://www.forecasts.org/djia.htm>.