Group Quiz 5 Chapter 2

1. The rate that a cricket chirps depends on the temperature of the surrounding air. You can estimate the temperature of the air by counting cricket chirps! Experiments have shown that these estimates are very reliable. In fact, crickets have an edge over mercury thermometers in that their rate of chirping almost immediately zones in on the appropriate number of chirps for some temperature, whereas the rise or fall of mercury in a thermometer lags behind a change in the air temperature. On the other hand, a temperature estimate via cricket chirps is for the air near the cricket, not necessarily where you are. Some data are provided in the table:

Temperature (Fahrenheit)	Rate (number of chirps per minute)
50	43
60	86
70	129
80	172
90	215

(a) Let $g(F)$ represent the number of chirps per minute a cricket makes when the temperature is F degrees Fahrenheit. Find an equation for the function g. Verify that the graph of your equation comes close to the scattergram of the data.

(b) Find $g(73)$. What does your result mean in terms of the crickets chirping?

(c) Find the value for F where $g(F) = 100$. What does your result mean in terms of the crickets chirping?

(d) What is/are the temperature(s) at a field where crickets are not chirping?

2. For Spring 2003, part-time students at Centenary College paid $320 per credit for tuition and paid a part-time student fee of $10 per semester. Let $h(n)$ be the total one-semester cost (in dollars) of tuition and fee for a part-time student who is taking n credits.

   (a) What is the slope of h?

   (b) What does the slope represent in terms of the situation?

   (c) Find an equation for h.

   (d) What are the fees for a part-time student to take 18 credits?

   (e) If a student's sole source of funds for college is a $3100 scolarship, how many credits worth of courses can the student take?

3. A student drives toward school at a constant rate. After a while, his favorite song plays on the radio and he drives the rest of the way at a faster constant rate. Sketch a qualitative graph (no numbers or scale) that relates the distance d from home to the amount of time t that has elapsed.