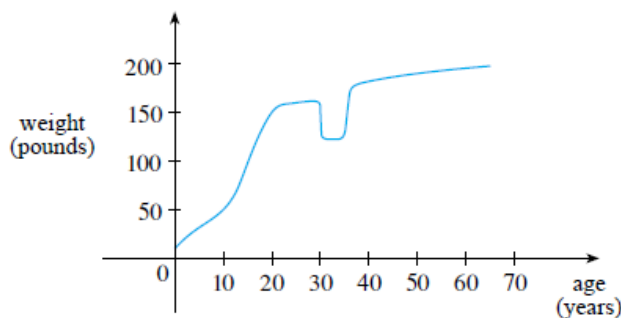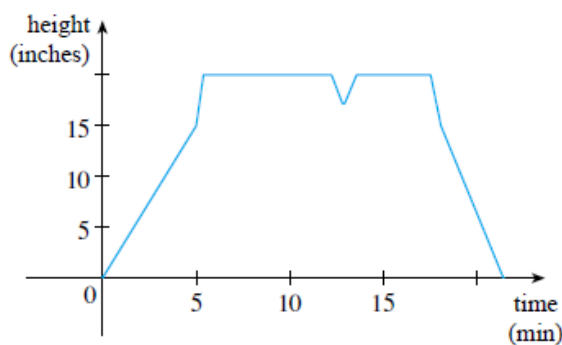Roll# Student 1:
Roll# Student 2:

Problem 1

a. The graph shown gives the weight of a certain person as a function of age. Describe in words how this persons weight varies over time. What do you think happened when this person was 30 years old?

b. The graph shows the height of the water in a bathtub as a function of time. Give a verbal description of what you think happened.

Problem 2

Classify each function as a power function, root function, polynomial (state its degree), rational function, trigonometric function, exponential function, or logarithmic function.

(a) $f(x) = x^\pi$

(b) $f(x) = \pi^x$

(c) $f(t) = 1 - 1.1t + 2.54t^2$

(d) $f(t) = \sin t - \cos t$

(e) $f(x) = \dfrac{x^2 - 2x}{x + 3x}$

(f) $f(x) = e^{-2x}$

Problem 3

Find the domain and sketch the graph of the following functions.

(a) $f(x) = 2 - 4x$

(b) $f(x) = x^2 - 2x + 1$

(c) $f(x) = \sin x$

(d) $f(x) = \sin 2x$

(e) $f(x) = 5\sin 2x$

(f) $f(x) = -5\sin 2x$

(g) $f(x) = -5\sin 2x + 5$

(h) $f(x) = \dfrac{1}{x}$

(i) $f(x) = -\dfrac{1}{x+2}$

(j) $f(x) = \begin{cases} x + 2 & \text{if } x \leq -1 \\ x^2 & \text{if } x > -1 \end{cases}$

(k) $f(x) = \begin{cases} x + 2 & \text{if } x < -3 \\ -2x & \text{if } -3 \leq x \leq 3 \\ -6 & \text{if } x > 3 \end{cases}$

(l) $f(x) = 2e^{-x} - 2$

Problem 4

The number N (in millions) of US cellular phone subscribers is shown in the table. (Midyear estimates are given.)

(a) Plot the data points on the graph.

(b) Use your scatter plot (plotted data points) to sketch a rough graph of N as a function of t.

(c) Use your graph to estimate the number of cell-phone subscribers at midyear in 2001 and 2005.

t	1996	1998	2000	2002	2004	2006
N	44	69	109	141	182	233