1. (8 points) Let $f(x) = 3x + \frac{2}{x} + 1$ and $g(x) = 6x - 7$.
Compute each of the following and simplify your answer.

a)$(g + f)(x)$

b)$f \circ g(x)$

c)$\frac{f(a+h)-f(a)}{h}$

2. (5 points) Bengt is running an experiment in which he is monitering the growth of bacteria. Let $T(t)$ be the temperature as a function of time and $B(T)$ be the number of bacteria as a function of temperature. Bengt has the following information:

a) Determine $B(T(2))$.

b) Determine the domain and range of $B(T(t))$.

3. (15 points) Erin is walking along the Mississippi River bluffs. She reaches a maximum height of 50 feet above the Mississippi after walking 44 minutes. After an hour, she ends her walk only 20 feet above the river. The following graph of $f(t)$ gives Erin's height in feet above the river in terms of the time t measured in minutes.

a) Complete the following multipart formula for $f(t)$.

$$f(t) = \begin{cases} 0.5t + 32 & 0 \leq t \leq 10 \\ 37 & 10 < t \leq 17 \\ -t + 54 & 17 < t \leq 36 \\ 0 & \\ 0 & \end{cases}$$

b) What is Erin's minimum height?

c) For how many minutes is Erin more than 32 feet above the river?

4. (12 points) After her walk, Erin leaves Rock Island and drives towards Rockford, which is 40 miles east and 30 miles north of Rock Island. Assume the road follows a straight line.

a) If Erin drives at 62 mph, how many minutes does her trip take?

b) In the town of Clinton, which is 15 miles north and 15 miles east of Rock Island, there is a tiny radio station, which always plays Erin's favorite jazz music. The radio station only transmits at a range of 12 miles in any direction. For how many miles of highway will Erin enjoy listening to her favorite station?

5. (10 points) Below is the graph of $g(x)$. Sketch a graph of $g(\frac{x}{2}+2)-3$, and label at least 3 points on your graph.