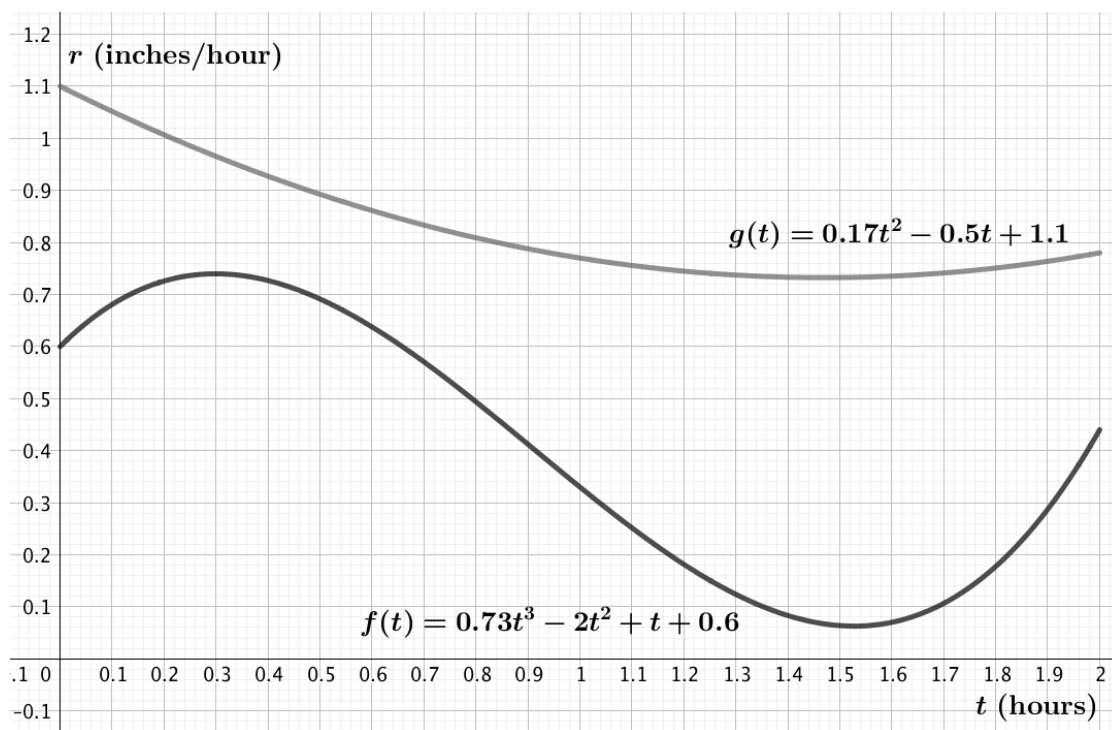The rates at which rain fell, in inches per hour, in two different locations (f and g) t hours after the start of a storm are given by $f(t) = 0.73t^3 - 2t^2 + t + 0.6$ and $g(t) = 0.17t^2 - 0.5t + 1.1$ (see graphs below).

1. Suppose we approximate the rates over the time interval $[0, 0.2]$ at the two locations with their values at the midpoint 0.1 of the interval. Using this approximation, about how much rain (measured in inches) fell at the two different locations (f and g) during this time interval? How much more rain fell at location g than at location f during this time interval?

2. Using the approximations above, sketch a rectangle on the graph representing the answer to the last part of the previous problem.

3. Continue approximating the rates of rainfall over the intervals $[0.2, 0.4]$, $[0.4, 0.6] \ldots [1.8, 2.0]$ using the values at the midpoints of these intervals and draw the corresponding rectangles as in the previous problem. What do the sum of the "areas" of these rectangles represent in this problem?

4. What does the "area" between the graphs of f and g represent in this problem? Set up and evaluate a definite integral to find this "area". Give correct units for your answer; It *isn't* area units!