Name	Date

Important: Before you begin, please make sure your calculator is in radian mode.

Part One: Rate of Change (Differential Calculus)

Determine the slope of the graph of the function $y = \sin x^2$ at the points x = 1, x = 2, and x = 3. Compare your methods and answers with those of groups near you. Did their methods differ from yours? Which method(s) do you think are the most accurate? Why?

Part Two: Accumulated Change (Integral Calculus)

Suppose you want to paint the side of a building that has a profile given by the function

$$f(x) = 50\sin\left(\frac{\pi\sqrt{x}}{10}\right)$$

and shown in the graph below. Both x and y = f(x) have units of feet.



1. Find an estimate of the total area of the building's side by splitting the area up into smaller regular shapes, finding the area of these shapes, then adding to obtain the overall area.

2. What change could you make to the way you found your estimate to improve it?