7. (8 total points)

   (a) (4 points) Set up but DO NOT EVALUATE an integral to compute the arc length of the curve $y = \sin^2(\pi x)$, for $0 \leq x \leq 1$.

   (b) (4 points) Approximate the length of the above curve via Simpson's rule with $n = 4$. SIMPLIFY THE SUM, but LEAVE YOUR ANSWER IN EXACT FORM.

8. (8 points) The odometer on your car is broken. However, you occasionally checked the speedometer during an 8 hour trip and obtained the data below. Use the trapezoidal rule to estimate the distance traveled.

time (in hours)	0	2	4	6	8
speed (in mph)	50	58	66	62	61

8. (8 total points)

   (a) (4 points) Set up but DO NOT EVALUATE an integral to compute the arc length of the curve $y = x^3$, for $0 \leq x \leq 1$.

   (b) (4 points) Approximate the length of the above curve using the trapezoidal rule with $n = 5$. Do not simplify the sum: leave your answer in exact form.

6. (10 points) Set up an integral (in terms of $f(x)$ and $g(x)$) for the volume of the solid of revolution that is obtained by rotating the region shown below around the x-axis. Then use Simpson's rule with $n = 4$ subintervals to approximate the volume. Show your work, and give your final answer as a decimal.