10. [6 points] Suppose that $p(x)$ and $q(x)$ are functions defined on $[2,4]$ with $0 \leq p(x) < q(x) \leq 3$ for all x in $[2,4]$. Let R be the region enclosed by the graphs of $p(x), q(x)$ and the lines $x = 2$ and $x = 4$.

For the following questions circle the correct answer. You do not need to show work.

a. [3 points] What is the volume of the solid obtained by rotating R about the line $y = 5$?

A: $\int_2^4 \pi[25 - (p(x) - q(x))^2]dx$

B: $\int_2^4 \pi[(5 - p(x))^2 - (5 - q(x))^2]dx$

C: $\int_2^4 \pi[(5 - (q(x) - p(x)))^2]dx$

D: $\int_2^4 \pi[(5 - q(x))^2 - (5 - p(x))^2]dx$

b. [3 points] What is the volume of the solid obtained by rotating R about the line $x = 7$?

A: $\int_2^4 2\pi(7 - x)(q(x) - p(x))dx$

B: $\int_2^4 2\pi x(q(x) - p(x))dx$

C: $\int_2^4 2\pi(7 + x)(q(x) - p(x))dx$

D: $\int_2^4 2\pi(x - 7)(q(x) - p(x))dx$

11. [5 points] A giant table leg is being built by rotating the region bounded by the graph of $y = \frac{1}{2}\cos(2\pi x) + 2$, the x-axis, the line $x = 0$, and the line $x = 1$ about the x-axis. Assume the units of x and y are in meters. Write an integral which gives the volume of the table leg. Do not evaluate the integral. What are the units of this integral?

The volume of the table leg is given by the integral $\int_0^1 \pi(\frac{1}{2}\cos(2\pi x)+2)^2 dx$

The units of this integral are m^3