Full Name: ID:

Serial number:

Question 1.   Use four rectangles and midpoints to approximate the area under the curve $y = \sin(\pi x)$ for $0 \leq x \leq 2$.

Question 2. A particle moves along a line so that its velocity at time t is $v(t) = \sin(t)\sin(2t)$. Find the total traveled distance by the particle during the time period $0 \leq t \leq \pi$.

Question 3. If
$$\int_{2x}^{x^2+1} \left(f(t) - e^{\sqrt{t}} \right) dt = 3x + 1$$
where f is continuous. Find $f(2)$.

Question 4. Evaluate
$$\int_{-1}^{3} \sqrt{3 - x^2 + 2x} \, dx$$

Question 5. Evaluate

a) $\displaystyle \lim_{n\to\infty} \sum_{i=1}^{n} \frac{1}{n + \frac{(i-1)^2}{n}}$

b) $\displaystyle \int_{-1}^{1} \left(e^{x^3 + \ln x^2} + \tan x \sqrt{1 - x^2} \right) dx$

c) $\displaystyle \int \frac{(x-1)}{x} \sec^2(x - \ln x) \tan(x - \ln x)\, dx$

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