

8. [12 points] In the following questions, circle the correct answer. You do not need to show any work, but make sure your answer is clear. No points will be given for unclear answers.

a. [3 points] Let $G(x)$ be an antiderivative of the function $g(x) = e^{x^2}$ such that $G(k) = 0$. The arc length of the graph of $G(x)$ from $x = 0$ to $x = 10$ is given by

$$\int_0^{10} \sqrt{1 + 4x^2 e^{2x^2}} dx \qquad \int_0^{10} \sqrt{1 + e^{2x^2}} dx \qquad \int_0^{10} \sqrt{1 + \left(\int_k^x e^{t^2} dt \right)^2} dx$$

b. [3 points] When he's very thirsty, O-guk drinks cans of orange juice at a rate of $O(t)$ cans per minute, and he drinks cans of lemon juice at a rate of $L(t)$ cans per minute. The total number of beverages that O-guk drinks, t minutes after he started, is given by

$$\int_0^x (O(t) + L(t)) dt \qquad \int_0^t (O(x) + L(x)) dx \qquad O(t) + L(t)$$

c. [3 points] If the function $P(x)$ is positive, then the function $M(x) = \int_0^{e^{-x}} P(t) dt$ is

increasing
constant
decreasing

d. [3 points] The volume of a solid whose base is a right triangle with two equal sides of length two, with square cross sections perpendicular to one of the sides of length two is

8
4/3
8/3
4