QUIZ 13

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Time: 13 minutes

Problem 1. TRUE or FALSE: $\int_0^\pi \sec^2(x)dx = \tan x|_0^\pi = \tan\pi - \tan 0 = 0$.

(a) TRUE (b) FALSE

Problem 2. Which of the following integrals equals the limit

$$\lim_{n\to\infty} \sum_{i=1}^{n} \frac{i}{n} \cdot \frac{i^2}{n^3}?$$

(a) $\int_0^i x^2 dx$ (b) $\int_0^1 x^2 dx$ (c) $\int_0^1 x^3 dx$ (d) $\int_0^i x^3 dx$ (e) $\int_0^n \frac{1}{x^4} dx$

Problem 3. Consider the piecewise function

$$f(x) = \begin{cases} x+2 & \text{if } x \in [-2, 0] \\ \sqrt{4-x^2} & \text{if } x \in (0, 2] \end{cases}$$

What is the value of $\int_{-2}^2 f(x)dx$? (Hint: draw the graph of f)

(a) 2 (b) π (c) 2π (d) $2+\pi$ (e) 4π (f) $4+\pi$

Problem 4. The value of the definite integral $\int_1^e \frac{1}{x} dx$ is equal to

(a) $\ln(1-e)$ (b) $\ln(e-1)$ (c) 0 (d) 1 (e) $\ln(1+e)$