

Six Embedded Questions for MAC 2233 Final Exam

- Find $\lim_{x \rightarrow 3} \frac{x^2 - 5x + 6}{x - 3}$.
(A) -1 (B) 1 (C) 5 (D) no limit (E) none of these
- Differentiate the function $y = (x^2 + 1)(2x - 3)$.
(A) $4x$ (B) $2x(2x - 3)$ (C) $2(x^2 + 1)$ (D) $6x^2 - 6x + 2$ (E) none of these
- Compute $\frac{dy}{dx}$ if $y = u^2 - 5u + 4$ and $u = 4x - 5$.
(A) $2x - 5$ (B) $2u - 5$ (C) $8x - 30$ (D) $32x - 60$ (E) none of these
- Given $x^2 + xy + y^2 = 3$. Find $\frac{dy}{dx}$ by using implicit differentiation.
(A) $-\frac{x + 2y}{2x + y}$ (B) $\frac{x + 2y}{2x + y}$ (C) $\frac{2x + y}{x + 2y}$ (D) $-\frac{2x + y}{x + 2y}$ (E) none of these
- Let $P(t)$ be the population (in millions) of a certain city t years after 1960, and suppose that $P(t)$ satisfies the differential equation $P'(t) = 0.02P(t)$ and $P(0) = 5$. Find a formula for $P(t)$.
(A) $5e^{-0.03t}$ (B) $5e^{0.03t}$ (C) $5e^{-0.02t}$ (D) $5e^{0.02t}$ (E) none of these
- Set up the definite integral that gives the area of the region bounded by the curves $y = x^2$ and $y = x$.
(A) $\int_{-1}^1 (x^2 - x) dx$ (B) $\int_{-1}^1 (x - x^2) dx$ (C) $\int_0^1 (x^2 - x) dx$
(D) $\int_0^1 (x - x^2) dx$ (E) none of these