Name: _____ Mark: _____ / 6

Mini-math Div 3/4: Monday, November 2, 2026 (6.9-6.14) - 12 minutes

1. (1 point) Using the substitution $u = x^3 - 2$, $\displaystyle\int_{-2}^{3} x^2(x^3-2)^3\,dx$ is equal to which of the following?

   A. $3\displaystyle\int_{-10}^{25} u^3\,du$ B. $\displaystyle\int_{-10}^{25} u^3\,du$ C. $\frac{1}{3}\displaystyle\int_{-10}^{25} u^3\,du$ D. $\displaystyle\int_{-2}^{3} u^3\,du$ E. $\frac{1}{3}\displaystyle\int_{-2}^{3} u^3\,du$

2. (1 point) $\displaystyle\int_0^1 \frac{2x-3}{x^2-5x+6}\,dx$ is

   A. $\ln 8$ B. $\ln\left(\frac{27}{2}\right)$ C. $\ln 432$ D. $\ln\left(\frac{16}{27}\right)$ E. $\ln\left(\frac{27}{16}\right)$

3. (1 point) $\displaystyle\int_1^\infty xe^{-x^2}\,dx$ is

   A. $-\frac{1}{e}$ B. $\frac{1}{2e}$ C. $\frac{1}{e}$ D. $\frac{2}{e}$ E. divergent

4. (1 point) Find $\displaystyle\int \frac{dx}{\sqrt{4x - x^2}}$

(A) $\arcsin(x-2) + C$ (B) $\dfrac{1}{2}\arcsin\left(\dfrac{x-2}{2}\right) + C$ (C) $2\arcsin(x-2) + C$

(D) $2\arcsin\left(\dfrac{x-2}{2}\right) + C$ (E) $\arcsin\left(\dfrac{x-2}{2}\right) + C$

5. (1 point) Find $\displaystyle\int (3x-1)\sin x\, dx$

(A) $(1-3x)\cos x + 3\sin x + C$ (B) $(3x-1)\cos x + 3\sin x + C$ (C) $-(3x-1)\cos x - 3\sin x + C$

(D) $(3x-1)\sin x + \cos x + C$ (E) $(1-3x)\sin x - 3\cos x + C$

6. (1 point) Which technique is most appropriate for evaluating $\displaystyle\int x \ln x\, dx$?

(A) substitution $u = \ln x$ (B) partial fractions (C) integration by parts

(D) completing the square (E) long division