Name: _____ Mark: _____ / 11

Mini-math Div 3/4: Friday, September 26, 2025 (6.4-6.14) - 20 minutes

1. (1 point) Suppose $V(x) = \int_0^{x^2} \sin t \, dt$. What is the derivative, $V'(x)$?

   A. $\cos x$ B. $\sin x$ C. $\sin x^2$ D. $2x \sin x^2$ E. $2x \cos x^2$

2. (1 point) Given $\int_1^7 f(x)\,dx = 4$, $\int_{-1}^7 f(x)\,dx = -3$, and $\int_1^5 f(x)\,dx = 6$, find $\int_{-1}^5 (2f(x)+3)\,dx$

   A. -2 B. 15 C. 16 D. 17 E. 28

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

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

4. (1 point) $\displaystyle\int_0^1 \frac{2x-3}{x^2-5x+6}\,dx$ is

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

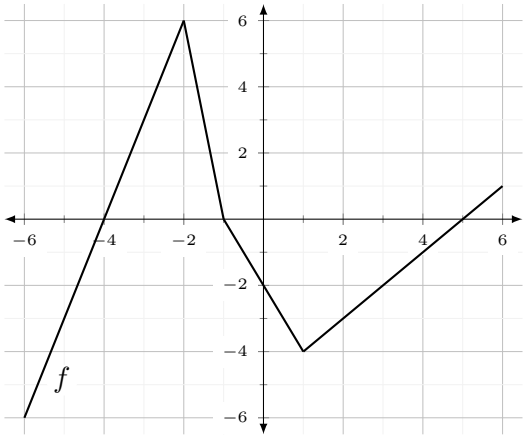
5. (1 point) $\displaystyle\int_1^\infty xe^{-x^2}\,dx$ is

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

6. (1 point) $\displaystyle\int_1^8 t^{-2/3}\,dt =$

A. -3 B. -1 C. $\dfrac{93}{160}$ D. 1 E. 3

7. (1 point) To the right is a graph of the function $f(x)$. Suppose $g(x) = \displaystyle\int_a^x f(t)\,dt$ and $g(1) = 3$. What is the minimum value of $g(x)$ on $[-6, 2]$?



A. -8

B. -5

C. -4

D. -3

E. -2

8. (2 points) Find $\displaystyle\int \frac{dx}{\sqrt{-x^2+4x-3}}$

9. (2 points) Find $\displaystyle\int (3x-1)\sin x\, dx$