$\frac{x^2}{2} + 2x \Big|_{-4}^{0}$

$0 - (0) = 0$

Mini Exam #3 A. P. Calculus Name Key

I. Multiple Choice

E 1. Which of the following expressions would evaluate the definite integral $\int_{-4}^{6} f(x)\,dx$, given that $f(x) = \begin{cases} |x-2| dx & \text{if } x \geq 0 \\ x+2 & \text{if } x < 0 \end{cases}$

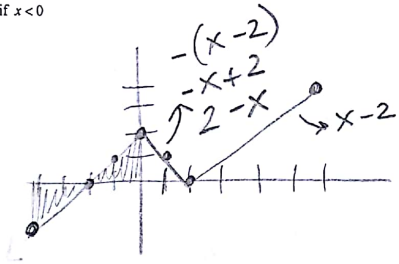
(A) $\int_{-4}^{6} (x-2)\,dx$

(B) $\int_{-4}^{0} (x+2)\,dx + \int_{0}^{6} (x-2)\,dx$

(C) $\int_{-4}^{0} (x+2)\,dx + \int_{0}^{2} (x-2)\,dx + \int_{2}^{6} (-x+2)\,dx$

(D) $\int_{-4}^{-2} (x+2)\,dx + \int_{-2}^{0} (x-2)\,dx + \int_{0}^{6} (2-x)\,dx$

(E) $\int_{-4}^{0} (x+2)\,dx + \int_{0}^{2} (2-x)\,dx + \int_{2}^{6} (x-2)\,dx$



C 2. The acceleration of an object moving along the x-axis is given by $a(t) = 18t - 2$, where the velocity is 12 m / sec when $t = 2$ sec and the position is 2 meters when $t = 1$ second. The position $x(t) =$

(A) $9t^3 - t^2 - 20t + 14$
(B) $9t^3 - t^2 + 20t - 26$
(C) $3t^3 - t^2 - 20t + 20$
(D) $3t^3 - t^2 + 20t - 20$
(E) $t^3 - t^2 - 20t + 22$

$\int (18t - 2)\,dt$

$v(t) = 9t^2 - 2t + C$

$12 = 9(2)^2 - 2(2) + C$

$12 = 36 - 4 + C$

$12 = 32 + C$

$C = -20$

$\int (9t^2 - 2t - 20)\,dt$

$x(t) = 3t^3 - t^2 - 20t + C$

$2 = 3 - 1 - 20 + C$

$2 = -18 + C$

$C = 20$

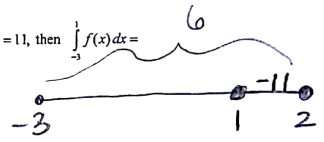
D 3. If $f(x) = \ln(\ln(1-x))$, Then $f'(x) =$

(A) $-\frac{1}{\ln(1-x)}$
(B) $\frac{1}{(1-x)\ln(1-x)}$
(C) $\frac{1}{(1-x)^2}$
(D) $-\frac{1}{(1-x)\ln(1-x)}$
(E) $-\frac{1}{\ln(1-x)^2}$

$\frac{1}{\ln(1-x)} \cdot \frac{1}{1-x} \cdot -1$

B 4. If $\int_{-3}^{2} f(x)\,dx = 6$ and $\int_{2}^{1} f(x)\,dx = 11$, then $\int_{-3}^{1} f(x)\,dx =$

(A) 5
(B) 17
(C) 3
(D) −5
(E) 9



$6 - (-11)$

C 5. The average value of $\sqrt{x}$ over the interval $0 \leq x \leq 2$ is

(A) $\frac{\sqrt{2}}{3}$
(B) $\frac{\sqrt{2}}{2}$
(C) $\frac{2\sqrt{2}}{3}$
(D) 1
(E) $\frac{4\sqrt{2}}{3}$

$\frac{\int_0^2 x^{1/2}\,dx}{2}$

$\frac{2}{3}x^{3/2} \Big|_0^2 = \frac{2}{3} \cdot 2\sqrt{2}$

$\frac{2\sqrt{2}}{3}$