1. What is the area of the region between the graphs of $y = x^4$ and $y = -x$ from $x = 0$ to $x = 2$?

(A) $\frac{2}{3}$ (B) $\frac{8}{3}$ (C) 4 (D) $\frac{14}{3}$ (E) $\frac{16}{3}$

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2. The area of the region enclosed by the graph of $y = x^2 + 1$ and the line $y = 5$ is

(A) $\frac{14}{3}$ (B) $\frac{16}{3}$ (C) $\frac{28}{3}$ (D) $\frac{32}{3}$ (E) 8π

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3. The area of the region enclosed by the graphs of $y = x$ and $y = x^2 - 3x + 3$ is

(A) $\frac{2}{3}$ (B) 1 (C) $\frac{4}{3}$ (D) 2 (E) $\frac{14}{3}$

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4. The area of the region in the first quadrant enclosed by the graph of $y = x(1 - x)$ and the x-axis is

(A) $\frac{1}{6}$ (B) $\frac{1}{3}$ (C) $\frac{2}{3}$ (D) $\frac{5}{6}$ (E) 1

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5. If the region enclosed by the y-axis, the line $y = 2$, and the curve $y = \sqrt{x}$ is revolved about the y-axis, the volume of the solid generated is

(A) $\frac{32\pi}{5}$ (B) $\frac{16\pi}{3}$ (C) $\frac{16\pi}{5}$ (D) $\frac{8\pi}{3}$ (E) π

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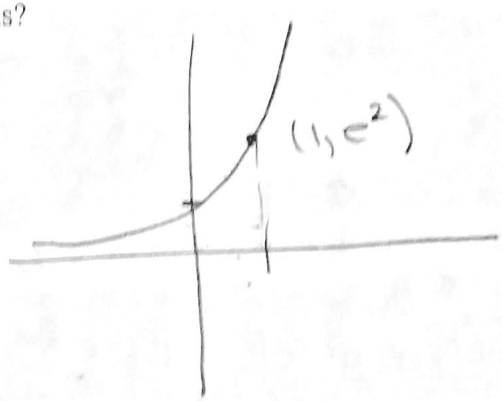
6. A region in the first quadrant is enclosed by the graphs of $y = e^{2x}$, $x = 1$, and the coordinate axes. If the region is rotated about the y-axis, the volume of the solid that is generated is represented by which of the following integrals?



(A) $2\pi \int_0^1 xe^{2x}\,dx$

(B) $2\pi \int_0^1 e^{2x}\,dx$

(C) $\pi \int_0^1 e^{4x}\,dx$

(D) $\pi \int_0^e y \ln y\,dy$

(E) $\frac{\pi}{4} \int_0^e \ln^2 y\,dy$

$2\pi \int_0^1 x e^{2x}\,dx$

$y' = 3x^{1/2}$ $9x$ $\int_{1/3}^{7} \sqrt{1+9x}\,dx$

7. Use your calculator to find the arclength of $y = 2x^{3/2}$ on $[1/3 \le x \le 7]$.

$s = 112/3$

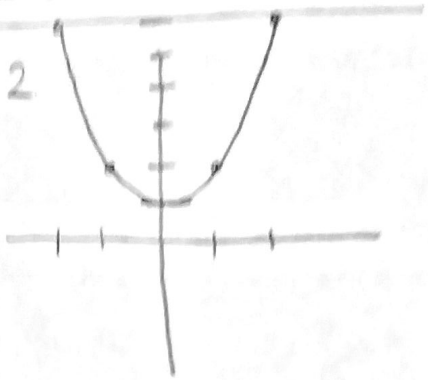
1. $A = \int_0^2 x^2 - (-x)\,dx$

$A = \int_0^2 x^2 + x\,dx$

$\frac{x^3}{3} + \frac{x^2}{2}\Big]_0^2$

$\frac{8}{3} + 2$

$\frac{14}{3}$



$\int_{-2}^{2} 5 - (x^2+1)\,dx$

$\int_{-2}^{2} 5 - x^2 - 1\,dx$

$\int_{-2}^{2} 4 - x^2\,dx$

$4x - \frac{x^3}{3}\Big]_{-2}^{2}$

$8 - \frac{8}{3} - \left(-8 + \frac{8}{3}\right)$

$16 - \frac{16}{3}$

$\frac{48}{3} - \frac{16}{3} = \frac{32}{3}$

3 (1,1) (2,3)

$A = \int_1^3 x - (x^2 - 3x + 3)\,dx$

$A = \int_1^3 x - x^2 + 3x - 3$

$= \int_1^3 -x^2 + 4x - 3$

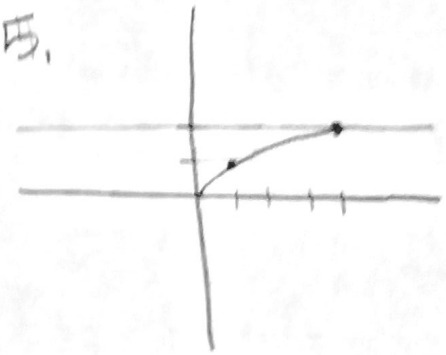
$-\frac{x^3}{3} + \frac{4x^2}{2} - 3x\Big]_1^3$

$-\frac{27}{3} + \frac{36}{2} - 9 - \left[-\frac{1}{3} + \frac{4}{2} - 3\right]$

$-9 + 18 - 9 + \frac{1}{3} - 2 + 3$

$\frac{4}{3}$

5.



$y = \sqrt{x}$

$y^2 = x$

$V = \pi \int_0^2 (y^2)^2\,dy$

$V = \pi \int_0^2 y^4\,dy$

$\pi * \frac{y^5}{5}\Big]_0^2$

$32\frac{\pi}{5}$