Math 104 Name_____

Hand in Hw # 3 Recitation Number_____

Spring 2014

3. Find the arclength of the curve $y = \frac{2\sqrt{3}}{9}\left(3x^2+1\right)^{3/2}$ from $x=-1$ to $x=2$.

(A) 8
(B) 2
(C) 9
(D) 4
(E) 6
(F) 21
(G) 24
(H) 27

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Spring 2013

PROBLEM 7: What is the centroid of the region bounded by the curves $y = x^2$ and $y = 8 - x^2$?

Hint: draw a picture of this region as your first step.

(a) $(-2, 3)$ (b) $(2, 5)$ (c) $(-1, 4)$ (d) $(0, 4)$ (e) $(0, 3)$ (f) $(1, 4)$

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Fall 2012

11. Suppose that the region bounded by $y = 4\tan(x^2)$ and the x-axis for $0 \leq x \leq \frac{\sqrt{\pi}}{2}$ is a thin homogeneous density plate of area A. Then the x-coordinate of the center of mass of the plate is:

(a) $\frac{2}{A}\pi^2$ (b) $\frac{2}{A}\pi$ (c) $\frac{1}{A}\ln 2$ (d) $\frac{3}{A}\sqrt{\pi}$ (e) 0 (f) $\frac{e\pi}{2}$

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Spring 2012

12. What is the area of the surface obtained by rotating the part of the curve $y = \sqrt{4 - x^2}$ from $x = 0$ to $x = 1$ around the $x-$axis?

A) 4π B) 2π C) π D) $\sqrt{2}\pi$ E) 3π F) 8π

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Fall 2010

7. What is the arclength of the part of the curve $y = \frac{1}{12}e^x + 3e^{-x}$ for $\ln 2 \leq x \leq \ln 4$?

(A) $\frac{5}{12}$ (B) $\frac{1}{2}$ (C) $\frac{7}{12}$ (D) $\frac{2}{3}$ (E) $\frac{3}{4}$ (F) $\frac{5}{6}$ (G) $\frac{11}{12}$ (H) 1

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Spring 2010

10. An artist is designing a wine glass in a flower shape, which can be generated by rotating the region bounded by $y = \sqrt{x}$ and $x = y$, between $x = 0$ and $x = 1$, about x-axis. What is the surface area (which contains both the inside and the outside surfaces) of such a glass?

(a) $\left(\frac{8\sqrt{2}-4}{3}+\sqrt{2}\right)\pi$ (b) $\left(\frac{8\sqrt{2}-4}{3}+\sqrt{5}\right)\pi$ (c) $\left(\frac{8\sqrt{2}-4}{3}+1\right)\pi$

(d) $\left(\frac{5\sqrt{5}-1}{6}+\sqrt{2}\right)\pi$ (e) $\left(\frac{5\sqrt{5}-1}{6}+\sqrt{5}\right)\pi$ (f) $\left(\frac{5\sqrt{5}-1}{6}+1\right)\pi$

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ANSWERS:

Spring 2014 # 3: F

Spring 2013 # 3: C

FALL 2012 # 11: C

SPRING 2012 # 12: A

FALL 2010 # 7: G

SPRING 2010 # 10: D