Calculus II	Name:
Study Guide 7	Class:
Due Date:	Score:

No Work ⇔ No Points

Use Pencil Only ⇔ Be Neat & Organized

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1. The arc length L of the curve $y = f(x)$ from $x = a$ to $x = b$ is given by $L = \int_a^b \sqrt{1 + [f'(x)]^2}\, dx$.

Consider the curve given by $y = \sqrt{x^3}$ from $x = 0$ to $x = 4$,

(a) (3 points) Find $f'(x)$.

(a) _____

(b) (4 points) Simplify $\sqrt{1 + [f'(x)]^2}$.

(b) _____

(c) (3 points) Find the arc length of the curve $y = f(x)$ over the given interval.

(c) _____

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2. The surface area S generated by revolving the portion of the curve $y = f(x)$ between $x = a$ and $x = b$ about the x–axis is given by $S = \int_a^b 2\pi f(x)\sqrt{1 + [f'(x)]^2}\, dx$.

Consider the function $f(x) = \sqrt{9 - x^2}$ and the interval $[-1, 1]$,

(a) (3 points) Find $f'(x)$.

(a) —————

(b) (4 points) Simplify $f(x)\sqrt{1 + [f'(x)]^2}$.

(b) —————

(c) (3 points) Find the surface area generated by revolving the curve described above by $y = f(x)$ over the given interval.

(c) —————

3. Consider the region bounded by $y = x$, $y = e^x$, $x = 0$, and $x = 1$.

(a) (5 points) Find the area of the above region. Detailed drawing required.

(a) _____

(b) (7 points) Find the volume of the solid generated when the above region is revolved about x – axis. Detailed drawing required.

(b) _____

4. Consider the region bounded by $y = \dfrac{2}{\sqrt{x}}$, $y = 0$, $x = 1$, and $x = 4$.

    (a) (7 points) Find the volume of the solid with cross-section in the shape of a square with one side on the region perpendicular to the $x-$axis. Detailed drawing required.

                      (a) _____

    (b) (7 points) Find the volume of the solid with cross-section in the shape of a semicircle with diameter on the region perpendicular to the $x-$axis. Detailed drawing required.

                      (b) _____

5. (4 points) Consider the function $f(x) = \sqrt[3]{x}$ and the interval $[-1, 1]$. Find a number c in the given interval such that $f(c) = f_{ave}$.

                      5. _____