

YOUR NAME: _____

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Read each problem **very carefully** before starting to solve it. Each problem is worth 10 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Use substitution to evaluate the following integrals:

(a) $\int \frac{\sin 2x}{1 + \cos^2 x} dx$

(b) $\int_1^4 \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$

2. Evaluate the integral $\int \frac{dx}{\sqrt{9 - 16x^2}}$.

3. Sketch the region enclosed by the curves $x + y = 4$, $x - y = 0$ and $y + 3x = 4$ and compute its area.

4. Find the volume of the solid with base the region enclosed by $y = x^2$ and $y = 3$ and whose cross-sections perpendicular to the y -axis are squares.

5. Find the volume of the solid obtained by revolving the region enclosed by the graphs $y = 2\sqrt{x}$ and $y = x$ about the line $x = -2$.