

Math 232 Calculus 2 Spring 15 Sample midterm 1

- (1) Find $\int x \cos(-3x^2) dx$.
- (2) Find $\int \frac{1}{3}x^2 \sqrt[4]{1-x^3} dx$.
- (3) Find the area between the two curves $y = \sin(2x)$ and $y = \cos(x)$ on the interval $[0, \pi/2]$.
- (4) Consider the ellipsoid $x^2 + 16y^2 + 16z^2 = 1$.
 - (a) Write down a formula for the area of the vertical cross sections perpendicular to the x -axis for a fixed value of x .
 - (b) Use your answer above to find the volume of the ellipsoid.
- (5) Find the average value of $e^{-x/3}$ on the interval $[-3, 3]$.
- (6) Use discs to find the volume of the object formed by rotating the triangle with vertices $(2, 0)$, $(1, 1)$ and $(1, 0)$ about the y -axis.
- (7) Consider the subset of the plane lying below the curve $y = x^2 - 9x$ and above the x -axis. Use shells to find the volume of the object formed by rotating this region about the x -axis.
- (8) Find $\int x^2 \ln(x) dx$.
- (9) Find $\int e^{-2x} \cos(3x) dx$.
- (10) Find $\int_0^{\pi/2} \sin^3(x) \cos^2(x) dx$.
- (11) Find $\int \cos(3x) \cos(5x) dx$.
- (12) Find $\int \frac{x^2}{\sqrt{x^2+1}} dx$.