

Calculus and Analytic Geometry Math, Section 5

Review for Test 1

- 6.1 Find the area of the region enclosed by the curves $y = 2x - x^3$ and $y = 2x - x^2$.
- 6.2 Find the volume of the solid generated by revolving the region R about the x -axis, where R is bounded by $y = x$, $y = 2 - x^2$, $x = 0$.
- 6.3 Find the volume of the solid generated by revolving the region R about the y -axis, where R is bounded by $y = x\sqrt{1 + x^3}$, $y = 2$, $x = 0$.
- 6.5 Find the average of the function $y = \ln x$ on the interval $[1, 2]$.
- 7.7 Use L'Hôpital's rule to find the limits

$$\lim_{x \rightarrow 0} \frac{\tan x - x}{x^3}, \quad \lim_{x \rightarrow \infty} x^{1/x}.$$

- 8.1 Use integration by parts to evaluate the integrals

$$\int x^2 e^{3x} dx, \quad \int_1^2 (\ln x)^3 dx.$$

- 8.2 Find an antiderivative of $\sin^4 x \cos^5 x$.
- 8.3 Use a trigonometric substitution to evaluate

$$\int \frac{dx}{x^2 \sqrt{4 - x^2}}.$$

- 8.4 Use partial fractions to find an antiderivative of

$$\frac{3x - 5}{x^2 - x - 2}.$$