

Calculus II - Math 152 Homework #1 - due Tuesday 1/12

• **Problems from the Book:** (Feel free to work on more problems in these sections for extra practice.)

- §4.9: 1-15(Odd), 23, 26, 27, 29, 33, 37, 49, 51, 57
- §5.1: 2, 5, 11, 12, 15, 17, 19, 21, 26*
- A38 (Appendix E): 1-7 (Odd), 11-19 (Odd), 21, 22, 24, 25, 29-31, 43
- §5.2: 1, 5, 7, 9, 21, 22, 29, 33, 35-41 (Odd), 50

• **Additional Problems:**

1. Write the following sum in sigma notation: $\frac{1}{4} + \frac{4}{5} + \frac{9}{6} + \frac{16}{7} + \dots + \frac{100}{13}$
2. Let A = the net area of the region between the graph of $f(x) = 2x - 2$ and the x -axis for $0 \leq x \leq 3$.
 - (a) Find an expression for A using limits and sigma notation. Evaluate this limit to find A exactly.
 - (b) Verify your answer from part (a) by looking at the graph of f and the corresponding net area.
3. Given that $\int_0^\pi \sin x \, dx = 2$, evaluate the following.

(a) $\int_0^{2\pi} \sin x \, dx$

(d) $\int_\pi^\pi e^x \sin^2 x \, dx$

(b) $\int_\pi^0 \sin x \, dx$

(e) Given that $\int_0^{\pi/3} \sin x \, dx = \frac{1}{2}$, $\int_{\pi/3}^\pi \sin x \, dx = ?$

(c) $\int_0^\pi 3 - 2 \sin x \, dx$

*5.1.26 is a great problem in which you derive the area of a circle using limits and area formula for triangles.

Note: Equation 3.3.2 is $\lim_{\theta \rightarrow 0} \frac{\sin \theta}{\theta} = 1$.