ACMAT161 Summer 2024
Professor Manguba-Glover
Homework 22 Name: _____

Show all work, simplify, and box your answers. If you do the problem incorrectly, or don't show sufficient work, you will be asked to rewrite the problem for full credit.

Due next class. Students who turn assignments in late (or do not attempt a problem) forfeit their ability to rewrite those problems for credit.

1. Suppose that f and h are integrable and that

$$\int_1^9 f(x)\,dx = -1,\ \int_7^9 f(x)\,dx = 5,\ \int_7^9 h(x)\,dx = 4$$

Use the rules in Table 5.3 to find

(a) $\int_1^9 -2f(x)\,dx$ (c) $\int_7^9 [2f(x) - 3h(x)]\,dx$ (e) $\int_1^7 f(x)\,dx$

(b) $\int_7^9 [f(x) + h(x)]\,dx$ (d) $\int_9^1 f(x)\,dx$ (f) $\int_9^7 [h(x) - f(x)]\,dx$

2. Graph the integrand and use areas to evaluate the integral: $\int_{-2}^{4} \left(\frac{x}{2} + 3\right)\,dx$

3. Graph the integrand and use areas to evaluate the integral: $\int_{-3}^{3} \sqrt{9 - x^2}\,dx$

4. Evaluate $\int_{-2}^{0} (2x + 5)\,dx$

5. Evaluate $\int_0^1 (x^2 + \sqrt{x})\,dx$

6. Evaluate $\int_0^{\pi/3} 2\sec^2 x\,dx$

7. Evaluate $\int_1^{-1} (r + 1)^2\,dr$

8. Evaluate $\int_{\sqrt{2}}^{1} \left(\frac{u^7}{2} - \frac{1}{u^5}\right)\,du$

9. Evaluate $\int_1^2 \frac{x^3 + 3x^6}{x^4}\,dx$

10. Evaluate $\int_0^3 (2\sin x - e^x)\,dx$