

(no textbook problems this week)

**Supplemental problems:**

1. Compute the following integrals. These all involve integration by parts, but for some of them you will need to combine integration by parts with some other techniques.

$$\begin{array}{lll}
 \text{(a)} \int e^{2x} \cos x \, dx & \text{(d)} \int \arctan x \, dx & \text{(g)} \int x^3 \cos(x/2) \, dx \\
 \text{(b)} \int \sinh(x) \sin(x) \, dx & \text{(e)} \int \arcsin x \, dx & \text{(h)} \int x \ln(2+x) \, dx \\
 \text{(c)} \int_1^2 \frac{(\ln x)^2}{x^3} \, dx & \text{(f)} \int \cos(\sqrt{x}) \, dx & \text{(i)} \int (x^2 + 2x - 1)e^{-3x} \, dx
 \end{array}$$

2. Compute the following integrals. These are based on content from §7.2 (trigonometric integrals), though one also requires the use of integration by parts.

$$\begin{array}{lll}
 \text{(a)} \int \cos(2\theta) \sin^8(2\theta) \, d\theta & \text{(d)} \int_0^{\pi/2} \sin^7 x \cos^5 x \, dx & \text{(g)} \int_0^{\pi/2} (\sin x + \cos x)^3 \, dx \\
 \text{(b)} \int_0^{\pi/4} \sin t \cos^3 t \, dt & \text{(e)} \int \cos^2 t \sin^4 t \, dt & \\
 \text{(c)} \int \cos^4(3t) \, dt & \text{(f)} \int x \sin^3 x \, dx &
 \end{array}$$

3. Compute the following integrals. These involve content from §7.3 (trigonometric substitution), which we will cover on Monday 2/12.

$$\begin{array}{ll}
 \text{(a)} \int_0^1 x^3 \sqrt{1-x^2} \, dx & \text{(c)} \int \sqrt{9-x^2} \, dx \\
 \text{(b)} \int_0^3 \frac{x}{\sqrt{36-x^2}} \, dx & \text{(d)} \int_0^5 x^2 \sqrt{25-x^2} \, dx
 \end{array}$$

**Important notes:**

- Regrade requests must be submitted via Gradescope within *one week of the due date* of the assignment.
- For full credit, you must show or explain your reasoning.
- You are encouraged to work in groups while solving the problems, but all submitted work must be your own work in your own words. Use of solution manuals or online solution databases is plagiarism, and will result in a 0 on the assignment in addition to being reported to Community Standards.

**Submission instructions:**

Before submitting your assignment scan it to a single pdf file and **view your pdf to make sure that it is clearly legible**. Then submit it as follows.

1. Go to <http://www.gradescope.com> and log in.
2. Select “Math 111” and the appropriate homework assignment, then select “submit pdf.”
3. For each written question, select the pages of your submission where your solution appears.
4. Click submit.