Math 132: Discussion Session: Week 9

Directions: In groups of 3-4 students, work the problems on the following page. Below, list the members of your group and your answers to the specified questions. Turn this paper in at the end of class. You do not need to turn in the question page or your work.

Additional Instructions: It is okay if you do not completely finish all of the problems. Also, each group member should work through each problem, as similar problems may appear on the exam.

Scoring:

<table>
<thead>
<tr>
<th>Correct answers</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–3</td>
<td>0%</td>
</tr>
<tr>
<td>4–6</td>
<td>80%</td>
</tr>
<tr>
<td>7–12</td>
<td>100%</td>
</tr>
</tbody>
</table>

Group Members:

7.3: Trigonometric Substitution.

(1) \[\int \frac{dx}{(9 - x^2)^{3/2}} = \]

(2) \[\int \frac{dx}{x\sqrt{x^2 + 25}} = \]

(3) \[\int \frac{dx}{\sqrt{x^2 + 2x + 10}} = \]

(4) \[\int \frac{x^2}{\sqrt{5x^2 - 49}} \, dx = \]

(5) \[\int \frac{dx}{(x^2 + a^2)^2} = \text{for } a > 0 \]

7.4: The Method of Partial Fractions.

(1) \[\int \frac{x^3 + 1}{x^2 + 1} \, dx = \]

(2) \[\int \frac{1}{(x + 2)(x^2 + 4x + 14)} \, dx = \]

(3) \[\int \frac{4x^2 - 12}{(2x + 5)^3} \, dx = \]

(4) \[\int \frac{x^5}{x^4 - 1} \, dx = \]

(5) \[\int \frac{10}{(x - 1)^2(x^2 + 4)} \, dx = \]

7.5: Strategy for Integration.

(1) \[\int x^3(\ln x)^2 \, dx = \]

(2) \[\int (5 \sec x - \cos x)^2 \, dx = \]
Math 132 Discussion Session: Week 9

7.3: Trigonometric Substitution. Compute the following integrals using trigonometric substitution. You might need to look up some trig integrals in the textbook.

1. \[ \int \frac{dx}{(9 - x^2)^{3/2}} \]
2. \[ \int \frac{dx}{x\sqrt{x^2 + 25}} \]
3. \[ \int \frac{dx}{\sqrt{x^2 + 2x + 10}} \]
4. \[ \int \frac{x^2}{\sqrt{5x^2 - 49}} \]
5. \[ \int \frac{dx}{(x^2 + a^2)^2} \text{ for } a > 0 \]

7.4: The Method of Partial Fractions. Compute the following integrals using the method of partial fractions:

1. \[ \int \frac{x^3 + 1}{x^2 + 1} \]
2. \[ \int \frac{1}{(x + 2)(x^2 + 4x + 14)} \]
3. \[ \int \frac{4x^2 - 12}{(2x + 5)^3} \]
4. \[ \int \frac{x^5}{x^4 - 1} \]
5. \[ \int \frac{10}{(x - 1)^2(x^2 + 4)} \]

7.5: Strategy for Integration. Compute the following integrals using any integration method you can.

1. \[ \int x^3(\ln x)^2 \]
2. \[ \int (5 \sec x - \cos x)^2 \]