MATH 1591 - Review of Chapter 7

1 Main Topics

1. Integration techniques:
   - Fitting integrands to basic rules on page 485.
   - Integration by parts, Theorem 7.1 on page 488.
   - Guidelines for trigonometric integrals on pages 497 and 500.
   - Trigonometric substitutions on page 506.
   - Partial fractions on page 516.
2. L'Hôpital's Rules for computation of limits on page 531.
3. Definitions of improper integrals on pages 540 and 543.

2 Representative Examples

1. Section 7.1: Examples 2, 4, 6.
2. Section 7.2: Examples 1, 2, 4.
3. Section 7.3: Examples 1, 2, 3, 4, 5, 6, 7, 8.
4. Section 7.4: Examples 1, 2, 4.
5. Section 7.5: Examples 1, 2, 3, 4.
6. Section 7.7: Examples 1, 2, 4, 5, 6, 7.
7. Section 7.8: Examples 1, 4, 6, 8, 9.

3 Review Exercises

Do the exercises on pages 550 and 551: 1, 5, 7, 10, 12, 13, 17, 18, 20, 22, 23, 25, 27, 31, 33, 71, 73, 75, 79, 81.

Evaluate the following integrals:

1. $\int x\sqrt{x^2-1}\,dx$
2. $\int x^2 \sin 2x\,dx$
3. $\int \frac{-12}{x^2\sqrt{4-x^2}}\,dx$
4. $\int_0^{16} \frac{1}{\sqrt[4]{x}}\,dx$

Use L'Hôpital's Rules to evaluate the limits:

1. $\lim_{x\to 0} \dfrac{\sin \pi x}{\sin 2\pi x}$
2. $\lim_{x\to \infty} \dfrac{e^{2x}}{x^2}$