
Math 152 - Week-In-Review 1

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Let us start with some review of antiderivatives. Evaluate the following integrals:

1. $\int \left(x^5 + 6x + 1 + \frac{2}{x} + \frac{3}{x^3} \right) dx$

2. $\int \left(\sqrt{x} + \sqrt[3]{x^2} + x^{5/3} + \frac{1}{\sqrt{x}} + \frac{4}{x^{2/5}} \right) dx$

3. $\int \left(e^x + \sin x + \sec^2 x + \csc x \cot x + \frac{10}{1+x^2} \right) dx$

4. $\int_0^3 \frac{1}{9+x^2} dx$

Use the substitution rule to evaluate the following integrals:

1. $\int x(8x^2 + 1)^{3/2} dx$

2. $\int \frac{5 \cos \sqrt{x}}{\sqrt{x}} dx$

3. $\int \frac{(\ln x)^3}{x} dx$

4. $\int \frac{e^x}{e^x + 1} dx$

5. $\int e^{5-7x} dx$

6. $\int \frac{e^{3x} + 5}{e^{3x} + 15x} dx$

7. $\int (3 \cos x + 6) \sec^2(\sin x + 2x) dx$

8. $\int \frac{3 \sin x \cos x}{1 + \cos^2 x} dx$

9. $\int_{e^3}^{e^5} \frac{1}{x \ln x} dx$

10. $\int_1^2 \frac{(x+1)}{x(x+2)} dx$

11. $\int_0^1 x(x+5)^9 dx$

12. $\int_0^1 \frac{11+2x}{x^2+1} dx$

Finding the area between curves:

13. Find the area enclosed by the parabola $y = x^2$ and the line $y = 2x$ between $x = -1$ and $x = 3$

14. Find the area bounded by the curves $y = \sin x$, $y = \sin 2x$ and $0 \leq x \leq \pi/2$.

15. Find the area bounded by the curves $x = y^2$ and $x = 2y^2 - 4$.

16. Set up the integral(s) to find the area of a triangle with vertices $(-2, 5)$, $(0, -3)$ and $(5, 2)$.