

Review 2A

Math 222

1. Evaluate $\int \frac{x dx}{(3x^2 + 1)^2}$.
2. Evaluate $\int \frac{\cos \sqrt{x}}{\sqrt{x}} dx$.
3. Evaluate $\int \sin^3 x \cos^2 x dx$.
4. Evaluate $\int \tan^3 x \sec^4 x dx$.
5. Evaluate $\int \frac{x^2}{4 + x^2} dx$.
6. Evaluate $\int \frac{x dx}{\sqrt{x^2 + 4x + 3}}$.
7. Evaluate using partial fractions $\int \frac{6x - 14}{x^2 - 2x - 3} dx$.
8. Evaluate $\int \frac{3x^3 + x^2 - 26x - 9}{x^3 - 9x} dx$.
9. Evaluate $\int x \cos x dx$.
10. Evaluate $\int e^{2x} \sin x dx$.

Answers to problems above: 1. $-\frac{1}{6(3x^2+1)} + C$ 2. $2 \sin \sqrt{x} + C$ 3. $\frac{1}{5} \cos^5 x - \frac{1}{3} \cos^3 x + C$ 4. $\frac{1}{4} \tan^4 x + \frac{1}{6} \tan^6 x + C$ 5. $x - 2 \tan^{-1} \frac{x}{2} + C$
6. $\sqrt{x^2 + 4x + 3} - 2 \ln(\sqrt{x^2 + 4x + 3} + x + 2) + C$ 7. $\ln|x - 3| + 5 \ln|x + 1| + C$ 8. $3x + \ln|x| - \frac{1}{6} \ln|x + 3| + \frac{1}{6} \ln|x - 3| + C$
9. $x \sin x + \cos x + C$ 10. $\frac{1}{5} e^{2x} (2 \sin x - \cos x) + C$

Review 2B

Math 222

1. Evaluate $\int x \cos x^2 dx$
2. Evaluate $\int \frac{dx}{x\sqrt{\ln x}}$.
3. Evaluate $\int \cos^2 x dx$.
4. Evaluate $\int \tan^3 x \sec^3 x dx$.
5. Evaluate $\int \frac{1}{\sqrt{x^2-3}} dx$.
6. Evaluate $\int \sqrt{8x-x^2} dx$.
7. Evaluate using partial fractions $\int \frac{5x-12}{x^2-5x+6} dx$.
8. Evaluate $\int \frac{2x^3-2x^2-8x+4}{x^3-4x} dx$.
9. Evaluate $\int x \ln x dx$.
10. Evaluate $\int x^3 e^{3x} dx$.

Answers to problems above: 1. $\frac{1}{2} \sin x^2 + C$ 2. $2\sqrt{\ln x} + C$ 3. $\frac{1}{2}x + \frac{1}{4} \sin(2x) + C$ 4. $\frac{1}{5} \sec^5 x + \frac{1}{3} \sec^3 x + C$ 5. $\ln \left| \frac{\sqrt{x^2-3}}{\sqrt{3}} + \frac{x}{\sqrt{3}} \right| + C$
6. $\frac{x\sqrt{8x-x^2}}{2} - 2\sqrt{8x-x^2} - 8 \arcsin\left(\frac{8-2x}{8}\right) + C$ 7. $3 \ln|x-3| + 2 \ln|x-2| + C$ 8. $2x - \ln|x| - \frac{1}{2} \ln|x^2-4| + C$ 9. $\frac{x^2 \ln x}{2} - \frac{x^2}{4} + C$
10. $\frac{1}{27} (9x^3 - 9x^2 + 6x - 2) e^{3x} + C$