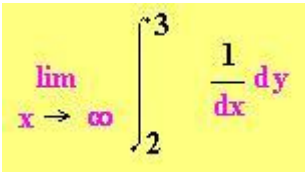

THE GENERAL POWER RULE AND THE LOGARITHMIC RULE FOR INTEGRATION

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Problem 1:

Integrate $\int 4x(2x^2+3)^{50}\,dx$. Note that "integrate" actually means to find the antiderivative for the function $f(x)=4x(2x^2+3)^{50}$!!!

Problem 2:

Evaluate $\int 8x(2x^2+3)^{50}\,dx$. Note that "evaluate" actually means to find the antiderivative for the function $f(x)=8x(2x^2+3)^{50}$!!!

Problem 3:

Evaluate $\int x(2x^2+3)^{50}\,dx$

Problem 4:

Evaluate $\int (2x^2+3)^{50}\,dx$

Problem 5:

Evaluate $\int (2x+3)^2\,dx$

Problem 6:

Evaluate $\int \frac{t^2+t}{(2t^3+3t^2)^4}\,dt$

Problem 7:

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

Problem 8:

Evaluate $\int \frac{v}{\sqrt{9-v^2}}\,dv$

Problem 9:

Evaluate $\int \sin^3 x \cos x\,dx$

Problem 10:

Evaluate $\int \csc^2 x \cot x\,dx$

Problem 11:

Evaluate $\int \sin x \cos x\,dx$

Problem 12:

Evaluate $\int \frac{\cos 2x}{\sin^5 2x}\,dx$

Problem 13:

Evaluate $\int (1-\cos \frac{t}{2})^2 \sin \frac{t}{2}\,dt$

Problem 14:

Evaluate $\int \frac{2e^x - 2e^{-x}}{(e^x + e^{-x})^2}\,dx$

Problem 15:

Evaluate $\int \frac{1}{4x-1}\,dx$

Problem 16:

Evaluate $\int \frac{3x^2+1}{x^3+x}\,dx$

Problem 17:

Evaluate $\int \frac{\sec^2 x}{\tan x}\, dx$

Problem 18:

Evaluate $\int \frac{x+1}{x^2+2x}\, dx$

Problem 19:

Evaluate $\int \frac{x^2+x+1}{x^2+1}\, dx$

Problem 20:

Evaluate $\int \tan x \; dx$

Problem 21:

Evaluate $\int \sec x \; dx$

Problem 22:

Evaluate $\int \frac{e^{2x}}{1+e^{2x}}\, dx$

SOLUTIONS

You can find detailed solutions below the link for this problem set!

1. $F(x)=\frac{1}{51}(2x^2+3)^{51}+C$	2. $F(x)=\frac{2}{51}(2x^2+3)^{51}+C$
3. $F(x)=\frac{1}{204}(2x^2+3)^{51}+C$	4. Evaluation (integration) or finding an antiderivative is beyond the scope of this course.
5. $F(x)=\frac{4}{3}x^3+6x^2+9x+\frac{9}{2}+C$ or $F(x)=\frac{4}{3}x^3+6x^2+9x+C$	6. $F(t)=\frac{-1}{18(2t^3+3t^2)^3}+C$
7. $F(x)=-\frac{1}{4}\left(1-\frac{1}{x}\right)^4+C$	8. $F(v)=-\sqrt{9-v^2}+C$
9. $F(x)=\frac{1}{4}\sin^4 x+C$	10. $F(x)=-\frac{1}{2}\csc^2 x+C$ or $F(x)=-\frac{1}{2}\cot^2 x+C$
11. $F(x)=\frac{1}{2}\sin^2 x+C$ or $F(x)=-\frac{1}{2}\cos^2 x+C$	12. $F(x)=\frac{-1}{8\sin^4 2x}+C$
13. $F(t)=\frac{2}{3}\left(1-\cos\frac{t}{2}\right)^3+C$	14. $F(x)=\frac{-2}{e^x+e^{-x}}+C$
15. $F(x)=\frac{1}{4}\ln\lvert 4x-1\rvert+C$	16. $F(x)=\ln\lvert x^3+x\rvert+C$
17. $F(x)=\ln\lvert\tan x\rvert+C$	18. $F(x)=\frac{1}{2}\ln\lvert x^2+2x\rvert+C$

19. $F(x) = x + \frac{1}{2} ln \left\| x^2 + 1 \right\| + C$	20. $F(x) = -ln \left\| \cos x \right\| + C$
21. $F(x) = -ln \left\| \sec x + \tan x \right\| + C$	22. $F(x) = ln \left\| 1 + e^{2x} \right\| + C$