Sudoku Puzzle with Definite Integrals
(Basic Integrals, Integration by Parts, Area Under a Curve)
A Puzzle by David Pleacher

Solve the 36 integral problems below and place the answer in the corresponding cell (labeled A, B, C, … Y, Z, a, b,.. i, j).
Your answers should be integers from 1 to 9 inclusive.
Then solve the resulting SUDOKU puzzle.

The rules of Sudoku are simple.
Enter digits from 1 to 9 into the blank spaces.
Every row must contain one of each digit.
So must every column, and so must every 3x3 square.
Each Sudoku has a unique solution that can be reached logically without guessing.

A. $\int_0^3 \left(3-2x+x^2\right)dx=$

B. $3\int_0^2 \left(2-x\right)^2 dx=$

C. $\frac{9}{2}\int_{-3}^{-1} \left(\frac{1}{x^2}-\frac{1}{x^3}\right)dx=$

D. $\int_1^3 \left(\frac{3}{2}x^2-\frac{9}{2}x+3\right)dx=$

E. $3\int_{-1}^1 \left(2x^2-x^3\right)dx=$

F. $\int_0^2 \left(2+x\right)dx=$

G. $\int_0^3 t^2\,dt=$

H. Determine the area bounded by the x-axis, the function $y = \frac{5}{2\sqrt{2x+1}}$, x = 0, and x = 4.

I. Determine the area bounded by the x-axis, the function $y = \frac{3x}{\sqrt{2x^2+1}}$, x = 0, and x = 2.

J. $\int_0^4 \frac{\left(x^3-2\right)dx}{8} =$

K. $\int_1^4 \frac{dx}{\sqrt{x}} =$

L. $\int_0^{\frac{\pi}{2}} 9\cos x\,dx$

M. $\int_0^{\frac{\pi}{6}} \frac{14\sin 2x}{\cos^2 2x}dx$

N. $\int_{-1}^{1} \left(\frac{9\left(x+1\right)^2}{8}\right)dx =$

O. Determine the total area bounded by the curve $y = x^3 - 4x$ and the x-axis.

P. $\int_0^2 \left(\frac{3\sqrt{4x+1}}{13}\right)dx =$

Q. $\int_1^4 \frac{3}{4}\left(\sqrt{x} + \frac{1}{\sqrt{x}}\right)dx =$

R. $\int_0^2 \frac{27}{100}(x+1)(2x+6)\,dx =$

S. $\int_1^e \ln x\,dx =$

T. Determine the area under one arch of the curve y = sin(x).

U. Determine the area bounded by the x-axis, the function $y = x^3 + 2x$, x = 0, and x = 2.

V. Determine the area bounded by the x-axis, the function y = 2x + 3, x = 0, and x =1.

W. Determine the area between the curve $y = \frac{1}{\sqrt{x}}$, the x-axis, and the lines x = 1 and x = 4.

X. $\int_1^2 \frac{9}{49}(2x+1)^2\,dx =$

Y. $\int_0^{\ln 6} e^x\,dx =$

Z. $\int_{-1}^{1} 5\sqrt[3]{x^2}\,dx =$

a. Determine the area contained between the x-axis and one arch of the curve y = 3 cos(3x).

b. Determine the area between the curve $x = 6(1 - y^2)$ and the y-axis.

c. Determine the area bounded by $y^2 = x - 1$ and $y = x - 3$. Then double your answer.

d. $\int_1^2 (2x+5)\,dx =$

e. $\int_{1}^{e^4} \frac{dx}{x} =$

f. Determine the area bounded by $x = -2$, $x = 0$, $y = x^3$, and $y = -x$.

g. $\int_{0}^{\pi} 3\cos^2 x \sin x \, dx$

h. $\int_{0}^{\sqrt{3}} \frac{6x dx}{\sqrt{4 - x^2}} =$

i. $\int_{1}^{2} 3x^2 \, dx =$

j. $\int_{1}^{e} \frac{10 \ln x \, dx}{x} =$

A				B	C		D	
	E	F			G	H		
I			J				K	L
		M		N		O		P
	Q		R	S		T		
U		V			W		X	
Y	Z		a					b
		c	d		e		f	
	g			h		i		j

Here is a blank SUDOKU board for you to use:

Solution to the Sudoku With Definite Integrals Puzzle

A = 9
B = 8
C = 5
D = 1

E = 4
F = 6
G = 9
H= 5

I = 3
J = 7
K = 2
L = 9

M = 7
N = 3
O = 8
P = 1

Q = 5
R = 9
S = 1
T = 2

U = 8
V = 4
W = 2
X = 3

Y = 5
Z = 6
a = 2
b =8

c = 9
d = 8
e = 4
f = 6

g = 2
h = 6
i = 7
j = 5

9	7	2	6	8	5	4	1	3
1	4	6	3	2	9	5	8	7
3	8	5	7	4	1	6	2	9
2	9	7	4	3	6	8	5	1
6	5	3	9	1	8	2	7	4
8	1	4	5	7	2	9	3	6
5	6	1	2	9	7	3	4	8
7	3	9	8	5	4	1	6	2
4	2	8	1	6	3	7	9	5