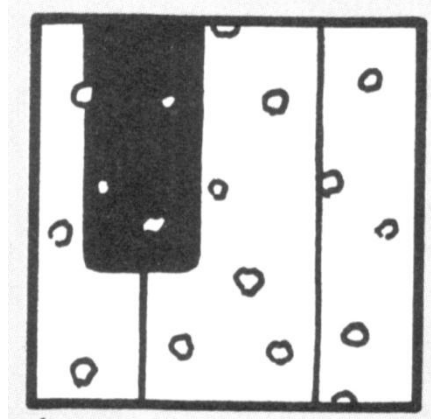


## Turvy for Integration -- Answer Key

By David Pleacher



Here is the title right-side-up: Cookie crumbs on a piano

Here is the title upside-down: Abe Lincoln walking by a tall fence in a snowstorm

### INTEGRAL PROBLEM

1. Evaluate  $\int \left( \frac{1}{x^4} + \frac{1}{x^2} + x^{10} \right) dx$

2.  $\int 4 \left( \frac{1}{x} + x^{\frac{2}{5}} \right)^2 dx =$

3.  $\int \frac{x^2 - 9}{x + 3} dx =$

4.  $\int (\sin x - 3 \cot x \sin x) dx =$

5.  $\int \left( 2x^{-\frac{3}{7}} + \frac{5}{\sin^2 x} \right) dx =$

6.  $\int \csc^2 x \cos x dx =$

7.  $\int \frac{d}{dx} (3x^{-2} + \tan x - 4) dx =$

### CORRESPONDING ANSWER

W.  $-\frac{x^{-3}}{3} - x^{-1} + \frac{x^{11}}{11} + C$

K.  $-\frac{4}{x} + 20x^{\frac{2}{5}} + \frac{20}{9}x^{\frac{9}{5}} + K$

R.  $\frac{x^2}{2} - 3x + C$

P.  $-\cos x - 3 \sin x + C$

Y.  $\frac{7}{2}x^{\frac{4}{7}} - 5 \cot x + C$

G.  $-\csc x + C$

U.  $3x^{-2} + \tan x + K$

## INTEGRAL PROBLEM

8.  $\int \cos(2x)\sqrt{\sin(2x)} dx =$

9.  $\int \frac{x}{\sqrt{1-x^2}} dx =$

10. Given that  $g'(x) = (\sin x)(5 + 5\cos x)^3$ ,  
find  $g(x)$  if  $g(0) = 0$

11.  $\int 8x(x^2 + 7)^3 dx =$

12.  $\int \frac{x^2}{(2x^3 - 12)^4} dx =$

13.  $\int \frac{(2 + \sqrt{x})^6}{\sqrt{x}} dx =$

14.  $\int \left(3 - \frac{1}{x}\right)^{-2} \left(\frac{1}{x^2}\right) dx =$

15.  $\int \frac{\cos x}{(2 - 3\sin x)^4} dx =$

16.  $\int \frac{x}{\cos^2(3x^2)} dx =$

17.  $\int \frac{4x^3 - 3}{(x^4 - 3x)^2} dx =$

18.  $\int \cos x \cos(\sin x) dx =$

19.  $\int 3x \tan(3x^2) \sec^2(3x^2) dx =$

## CORRESPONDING ANSWER

B.  $\frac{1}{3} \sin^{\frac{3}{2}}(2x) + C$

C.  $-\sqrt{1-x^2} + C$

A.  $-\frac{1}{20}(5 + 5\cos x)^4 + 500$

M.  $(x^2 + 7)^4 + C$

I.  $\frac{-1}{18(2x^3 - 12)^3} + C$

L.  $\frac{2}{7} \left(2 + x^{\frac{1}{2}}\right)^7 + C$

F.  $-\left(3 - \frac{1}{x}\right)^{-1} + K$

T.  $\frac{1}{9}(2 - 3\sin x)^{-3} + C$

N.  $\frac{1}{6} \tan(3x^2) + C$

S.  $\frac{-1}{(x^4 - 3x)} + C$

O.  $\sin(\sin x) + C$

E.  $\frac{1}{4} \tan^2(3x^2) + C$