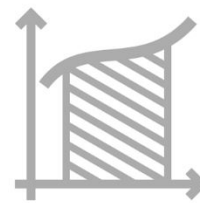


# Workbook



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# Integrals – Derivative Contained

## Integrals – Derivative Contained

### Questions:

Compute the following integrals:

- |   |   |  |
|---|---|--|
| 1) a. $\int \frac{2x}{x^2+1} dx$            | b. $\int \frac{x^2}{x^3+1} dx$              | c. $\int \frac{x+2}{x^2+4x+1} dx$                    |
| 2) a. $\int \cot x dx$                      | b. $\int \tan x dx$                         | c. $\int \frac{\sin x - \cos x}{\sin x + \cos x} dx$ |
| 3) a. $\int \frac{e^{x+2}}{e^x+1} dx$       | b. $\int \frac{1}{x \ln x} dx$              | c. $\int \frac{x^2+6x+4}{x^2+4x} dx$                 |
| 4) a. $\int e^{x^2} 2x dx$                  | b. $\int e^{x^3} x^2 dx$                    | c. $\int \frac{x}{e^{2x^2}} dx$                      |
| 5) a. $\int \frac{e^{\tan x}}{\cos^2 x} dx$ | b. $\int \frac{e^{\arctan x}}{1+x^2} dx$    | c. $\int \frac{\sin x \cos x}{e^{-\cos 2x}} dx$      |
| 6) a. $\int (\cos(2x^2+1) \cdot 4x) dx$     | b. $\int \cos(\sin x) \cdot \cos x dx$      | c. $\int \frac{\cos(\ln x)}{x} dx$                   |
| 7) a. $\int \cos(10x^4+1) x^3 dx$           | b. $\int \sin(x^2+1) x dx$                  | c. $\int \frac{\sin \sqrt{x}}{\sqrt{x}} dx$          |
| 8) a. $\int \frac{\ln x}{x} dx$             | b. $\int \frac{\arctan x}{1+x^2} dx$        | c. $\int \frac{\tan x}{\cos^2 x} dx$                 |
| 9) a. $\int \frac{2x}{\sqrt{x^2+1}} dx$     | b. $\int \frac{\cos x}{\sqrt{2 \sin x}} dx$ | c. $\int \frac{1}{x \sqrt{\ln x}} dx$                |
| 10) a. $\int \sqrt{x^2+1} \cdot 2x dx$      | b. $\int \sqrt{x^3+4} \cdot x^2 dx$         | c. $\int \frac{\sqrt{\ln x}}{x} dx$                  |

**Answer Key:**

- |   |   |   |
|---|---|---|
| 1) a. $\ln x^2+1 +C$                        | b. $\frac{1}{3}\ln x^3+1 +C$            | c. $\ln x^2+4x+1 +C$                    |
| 2) a. $\ln \sin x +C$                       | b. $-\ln \cos x +C$                     | c. $-\ln \sin x+\cos x +C$              |
| 3) a. $e^2\ln e^x+1 +C$                     | b. $\ln \ln x +C$                       | c. $x+\ln x^2+4x +C$                    |
| 4) a. $e^{x^2}+C$                           | b. $\frac{1}{3}e^{x^3}+C$               | c. $-\frac{1}{4}e^{-2x^2}+C$            |
| 5) a. $e^{\tan x}+C$                        | b. $e^{\arctan x}+C$                    | c. $-\frac{1}{4}e^{\cos 2x}+C$          |
| 6) a. $\sin(2x^2+1)+C$                      | b. $\sin(\sin x)+C$                     | c. $\sin(\ln x)+C$                      |
| 7) a. $\frac{1}{40}\sin(10x^4+1)+C$         | b. $-\frac{1}{2}\cos(x^2+1)+C$          | c. $-2\cos\sqrt{x}+C$                   |
| 8) a. $\frac{1}{2}(\ln x)^2+C$              | b. $\frac{1}{2}(\arctan x)^2+C$         | c. $\frac{1}{2}\tan^2 x+C$              |
| 9) a. $2\sqrt{x^2+1}+C$                     | b. $2\sqrt{2\sin x}+C$                  | c. $2\sqrt{\ln x}+C$                    |
| 10) a. $\frac{2}{3}(x^2+1)^{\frac{3}{2}}+C$ | b. $\frac{2}{9}(x^3+4)^{\frac{3}{2}}+C$ | c. $\frac{2}{3}(\ln x)^{\frac{3}{2}}+C$ |