Chapter 7 Review

Note: Some questions don't have the "+C" because it took up too much space. It really does belong as part of the answer to all indefinite integrals.

1.) $\int x\sec^2 x\,dx =$

A.) xtanx + C

B.) $\frac{x^2}{2}\tan x + C$

C.) $\sec^2$x + 2$\sec^2$xtanx + C

D.) xtanx - ln|cosx| + C

E.) xtanx + ln|cosx| + C

2)

$\int_1^2 \frac{(x+1)dx}{x^2+2x} =$

A.) ln 8 - ln 3

B.) $\frac{\ln 8 - \ln 3}{2}$

C.) ln 8

D.) $\frac{3\ln 2}{2}$

E.) $\frac{3\ln 2 + 2}{2}$

3)

Use integration by parts to evaluate $\int x\tan^{-1}(x)\,dx$.

(a) $\frac{1}{2}x^2\tan^{-1}(x) - \tan^{-1}(x) + C$

(b) $\frac{1}{2}x^2\tan^{-1}(x) + \frac{x}{2} + C$

(c) $\frac{1}{2}(x^2+1)\tan^{-1}(x) - \frac{x}{2} + C$

(d) $\frac{x}{1+x^2} - \tan^{-1}(x) + C$

(e) $\frac{1}{2}x^2 + \tan^{-1}(x) + C$

4)

The integral $\int_1^2 \frac{dx}{\sqrt[3]{x-1}}$

A. converges to $\frac{3}{2}$

B. converges to 0

C. diverges

D. converges to -1

E. converges to $\frac{-3}{2}$

5)

$\int_0^1 e^x \sin(\pi x)\, dx = ?$

(a) $\frac{(e-1)\pi}{\pi^2+1}$ (b) $\frac{(e+1)\pi}{\pi^2+1}$

(c) $\frac{(e-1)\pi}{\pi^2-1}$ (d) $\frac{(e+1)\pi^2}{\pi-1}$ (e) $\frac{(e-1)\pi^2}{\pi+1}$

6)

$\int \sin^3 x \cdot \cos^4 x\, dx = ?$

(a) $\frac{\cos^7 x}{7} + \frac{\cos^5 x}{5}$ (b) $\frac{\cos^5 x}{5} - \frac{\cos^7 x}{7}$

(c) $\frac{\cos^7 x}{7} - \frac{\cos^5 x}{5}$ (d) $\frac{\cos^4 x}{4} - \frac{\sin^5 x}{5}$ (e) $\frac{\sin^5 x}{5} - \frac{\cos^4 x}{4}$

7)

$\int x\, e^{\pi x}\, dx = ?$

(a) $\frac{(\pi x-1)e^{\pi x}}{\pi}$ (b) $\frac{(\pi x-1)e^{\pi x}}{\pi^2}$

(c) $\frac{(x-\pi)e^{\pi x}}{\pi}$ (d) $\frac{(x-\pi)e^{\pi x}}{\pi^2}$ (e) $\frac{xe^{\pi x}}{\pi}$

8)

$\int_1^\infty \frac{dx}{\sqrt[3]{x^2}} = ?$

(a) 1 (b) $\frac{1}{3}$ (c) $\frac{2}{3}$ (d) 3 (e) ∞

9)

$\int_1^{e^2} x \ln x\, dx = ?$

(a) $\frac{2e^2+1}{4}$ (b) $\frac{e^2+3}{2}$ (c) $\frac{e^4+3}{4}$ (d) $\frac{2e^4+1}{2}$ (e) $\frac{3e^4+1}{4}$

10)

$$\int_0^1 x^{-\frac{2}{3}}dx = ?$$

(a) 1 (b) $\frac{1}{3}$ (c) $\frac{2}{3}$ (d) 3 (e) ∞

11)

$\int x\csc^2 x dx =$

(A) $\frac{x\csc^3 x}{6}+C$ (B) $x\cot x-\ln|\sin x|+C$ (C) $-x\cot x+\ln|\sin x|+C$

(D) $-x\cot x-\ln|\sin x|+C$ (E) $-x\sec^2 x-\tan x+C$

12)

$$\int_0^\infty 4x^3 e^{-\frac{x^4}{3}}dx = ?$$

(a) 1 (b) $\frac{1}{3}$ (c) $\frac{2}{3}$ (d) 3 (e) ∞

13)

. Integrate $\int_0^\pi \sin^3(x)\,dx$.

(a) 4/3 (b) 1 (c) 1/4 (d) 1/3 (e) 0

14)

$\int \frac{4x-41}{x^2-3x-10}dx = ?$ (a) $5\ln|x+2|-4\ln|x-5|$ (b) $7\ln|x-2|-3\ln|x+5|$

(c) $7\ln|x+2|-3\ln|x-5|$ (d) $5\ln|x-2|+4\ln|x-5|$ (e) $7\ln|x+2|+3\ln|x-5|$

15)

Which of the following gives the value of $\lim_{x\to\infty} \frac{\log_2 x}{\log_3 x}$?

(A) 1 (B) $\frac{\ln 3}{\ln 2}$ (C) $\frac{\ln 2}{\ln 3}$ (D) $\ln\left(\frac{3}{2}\right)$ (E) $\ln\left(\frac{2}{3}\right)$

16)

Which of the following gives the value of $\lim_{x\to\infty}\left(1+\frac{1}{x}\right)^{3x}$?

(A) 0 (B) 1 (C) e (D) e^2 (E) e^3

17)

What is $\lim_{m\to 0} \frac{1}{m}\ln\left(\frac{2+m}{2}\right)$?

(A) e^2 (B) 1 (C) 1/2 (E) 0 (E) Does not exist

18)

$\lim_{x\to 0}(1+2x)^{\csc x} =$

(A) 0 (B) 1 (C) 2 (D) e (E) e^2

ANSWERS

1) e
2) b
3) c
4) a
5) b
6) c
7) b
8) e
9) e
10) d
11) c
12) d
13) a
14) c
15) b
16) e
17) c
18) e