பயிற்சி 11.13

சரியான அல்லது மிகவும் ஏற்புடைய விடையினைக் கொடுக்கப்பட்ட நான்கு மாற்று விடைகளில் இருந்து தேர்ந்தெடுக்கவும்.

(1) $\int f(x)dx = g(x) + c$ எனில், $\int f(x)g'(x)dx$ என்பது

    (1) $\int (f(x))^2 dx$ (2) $\int f(x)g(x)dx$ (3) $\int f'(x)g(x)dx$ (4) $\int (g(x))^2 dx$

(2) $\int \dfrac{3^{\frac{1}{x}}}{x^2} dx = k\ (3^{\frac{1}{x}}) + c$ எனில், k -ன் மதிப்பு

    (1) $\log 3$ (2) $-\log 3$ (3) $-\dfrac{1}{\log 3}$ (4) $\dfrac{1}{\log 3}$

(3) $\int f'(x)e^{x^2} dx = (x-1)e^{x^2} + c$ எனில், $f(x)$ என்பது

    (1) $2x^3 - \dfrac{x^2}{2} + x + c$ (2) $\dfrac{x^3}{2} + 3x^2 + 4x + c$ (3) $x^3 + 4x^2 + 6x + c$ (4) $\dfrac{2x^3}{3} - x^2 + x + c$

(4) (x, y) என்ற ஏதேனும் ஒரு புள்ளியில் ஒரு வளைவரையின் சாய்வு $\dfrac{x^2-4}{x^2}$ ஆகும்.

. இவ்வளைவரை $(2, 7)$ என்ற புள்ளி வழியாகச் சென்றால், வளைவரையின் சமன்பாடு

(1) $y = x + \dfrac{4}{x} + 3$ (2) $y = x + \dfrac{4}{x} + 4$ (3) $y = x^2 + 3x + 4$ (4) $y = x^2 - 3x + 6$

(5) $\displaystyle\int \dfrac{e^x(1+x)}{\cos^2(xe^x)}\, dx =$

(1) $\cot(xe^x) + c$ (2) $\sec(xe^x) + c$ (3) $\tan(xe^x) + c$ (4) $\cos(xe^x) + c$

(6) $\displaystyle\int \dfrac{\sqrt{\tan x}}{\sin 2x}\, dx =$

(1) $\sqrt{\tan x} + c$ (2) $2\sqrt{\tan x} + c$ (3) $\dfrac{1}{2}\sqrt{\tan x} + c$ (4) $\dfrac{1}{4}\sqrt{\tan x} + c$

(7) $\displaystyle\int \sin^3 x\, dx =$

(1) $\dfrac{-3}{4}\cos x - \dfrac{\cos 3x}{12} + c$

(2) $\dfrac{3}{4}\cos x + \dfrac{\cos 3x}{12} + c$

(3) $\dfrac{-3}{4}\cos x + \dfrac{\cos 3x}{12} + c$

(4) $\dfrac{-3}{4}\sin x - \dfrac{\sin 3x}{12} + c$

(8) $\displaystyle\int \dfrac{e^{6\log x} - e^{5\log x}}{e^{4\log x} - e^{3\log x}}\, dx =$

(1) $x + c$ (2) $\dfrac{x^3}{3} + c$ (3) $\dfrac{3}{x^3} + c$ (4) $\dfrac{1}{x^2} + c$

(9) $\displaystyle\int \dfrac{\sec x}{\sqrt{\cos 2x}}\, dx =$

(1) $\tan^{-1}(\sin x) + c$ (2) $2\sin^{-1}(\tan x) + c$ (3) $\tan^{-1}(\cos x) + c$ (4) $\sin^{-1}(\tan x) + c$

(10) $\displaystyle\int \tan^{-1}\left(\sqrt{\dfrac{1-\cos 2x}{1+\cos 2x}}\right) dx =$

(1) $x^2 + c$ (2) $2x^2 + c$ (3) $\dfrac{x^2}{2} + c$ (4) $-\dfrac{x^2}{2} + c$

(11) $\displaystyle\int 2^{3x+5}\, dx =$

(1) $\dfrac{3(2^{3x+5})}{\log 2} + c$ (2) $\dfrac{2^{3x+5}}{2\log(3x+5)} + c$ (3) $\dfrac{2^{3x+5}}{2\log 3} + c$ (4) $\dfrac{2^{3x+5}}{3\log 2} + c$

(12) $\displaystyle\int \dfrac{\sin^8 x - \cos^8 x}{1 - 2\sin^2 x \cos^2 x}\, dx =$

(1) $\dfrac{1}{2}\sin 2x + c$ (2) $-\dfrac{1}{2}\sin 2x + c$ (3) $\dfrac{1}{2}\cos 2x + c$ (4) $-\dfrac{1}{2}\cos 2x + c$

(13) $\int \dfrac{e^x(x^2 \tan^{-1} x + \tan^{-1} x + 1)}{x^2 + 1}\ dx =$

(1) $e^x \tan^{-1}(x+1) + c$ (2) $\tan^{-1}(e^x) + c$ (3) $e^x \dfrac{(\tan^{-1} x)^2}{2} + c$ (4) $e^x \tan^{-1} x + c$

(14) $\int \dfrac{x^2 + \cos^2 x}{x^2 + 1} \operatorname{cosec}^2 x\, dx =$

(1) $\cot x + \sin^{-1} x + c$ (2) $-\cot x + \tan^{-1} x + c$

(3) $-\tan x + \cot^{-1} x + c$ (4) $-\cot x - \tan^{-1} x + c$

(15) $\int x^2 \cos x\, dx =$

(1) $x^2 \sin x + 2x \cos x - 2 \sin x + c$ (2) $x^2 \sin x - 2x \cos x - 2 \sin x + c$

(3) $-x^2 \sin x + 2x \cos x + 2 \sin x + c$ (4) $-x^2 \sin x - 2x \cos x + 2 \sin x + c$

(16) $\int \sqrt{\dfrac{1-x}{1+x}}\, dx =$

(1) $\sqrt{1-x^2} + \sin^{-1} x + c$ (2) $\sin^{-1} x - \sqrt{1-x^2} + c$

(3) $\log|x + \sqrt{1-x^2}| - \sqrt{1-x^2} + c$ (4) $\sqrt{1-x^2} + \log|x + \sqrt{1-x^2}| + c$

(17) $\int \dfrac{dx}{e^x - 1} =$

(1) $\log|e^x| - \log|e^x - 1| + c$ (2) $\log|e^x| + \log|e^x - 1| + c$

(3) $\log|e^x - 1| - \log|e^x| + c$ (4) $\log|e^x + 1| - \log|e^x| + c$

(18) $\int e^{-4x} \cos x\, dx =$

(1) $\dfrac{e^{-4x}}{17}[4 \cos x - \sin x] + c$ (2) $\dfrac{e^{-4x}}{17}[-4 \cos x + \sin x] + c$

(3) $\dfrac{e^{-4x}}{17}[4 \cos x + \sin x] + c$ (4) $\dfrac{e^{-4x}}{17}[-4 \cos x - \sin x] + c$

(19) $\int \dfrac{\sec^2 x}{\tan^2 x - 1}\, dx =$

(1) $2\log\left|\dfrac{1 - \tan x}{1 + \tan x}\right| + c$ (2) $\log\left|\dfrac{1 + \tan x}{1 - \tan x}\right| + c$

(3) $\dfrac{1}{2}\log\left|\dfrac{\tan x + 1}{\tan x - 1}\right| + c$ (4) $\dfrac{1}{2}\log\left|\dfrac{\tan x - 1}{\tan x + 1}\right| + c$

(20) $\int e^{-7x} \sin 5x \, dx =$

(1) $\dfrac{e^{-7x}}{74}[-7\sin 5x - 5\cos 5x] + c$

(2) $\dfrac{e^{-7x}}{74}[7\sin 5x + 5\cos 5x] + c$

(3) $\dfrac{e^{-7x}}{74}[7\sin 5x - 5\cos 5x] + c$

(4) $\dfrac{e^{-7x}}{74}[-7\sin 5x + 5\cos 5x] + c$

(21) $\int x^2 e^{\frac{x}{2}} dx =$

(1) $x^2 e^{\frac{x}{2}} - 4xe^{\frac{x}{2}} - 8e^{\frac{x}{2}} + c$

(2) $2x^2 e^{\frac{x}{2}} - 8xe^{\frac{x}{2}} - 16e^{\frac{x}{2}} + c$

(3) $2x^2 e^{\frac{x}{2}} - 8xe^{\frac{x}{2}} + 16e^{\frac{x}{2}} + c$

(4) $x^2 \dfrac{e^{\frac{x}{2}}}{2} - \dfrac{xe^{\frac{x}{2}}}{4} + \dfrac{e^{\frac{x}{2}}}{8} + c$

(22) $\int \dfrac{x+2}{\sqrt{x^2-1}} dx =$

(1) $\sqrt{x^2-1} - 2\log|x+\sqrt{x^2-1}| + c$

(2) $\sin^{-1} x - 2\log|x+\sqrt{x^2-1}| + c$

(3) $2\log|x+\sqrt{x^2-1}| - \sin^{-1} x + c$

(4) $\sqrt{x^2-1} + 2\log|x+\sqrt{x^2-1}| + c$

(23) $\int \dfrac{1}{x\sqrt{(\log x)^2 - 5}} dx =$

(1) $\log|x+\sqrt{x^2-5}| + c$

(2) $\log|\log x + \sqrt{\log x - 5}| + c$

(3) $\log|\log x + \sqrt{(\log x)^2 - 5}| + c$

(4) $\log|\log x - \sqrt{(\log x)^2 - 5}| + c$

(24) $\int \sin \sqrt{x} \, dx =$

(1) $2\left(-\sqrt{x} \cos \sqrt{x} + \sin \sqrt{x}\right) + c$

(2) $2\left(-\sqrt{x} \cos \sqrt{x} - \sin \sqrt{x}\right) + c$

(3) $2\left(-\sqrt{x} \sin \sqrt{x} - \cos \sqrt{x}\right) + c$

(4) $2\left(-\sqrt{x} \sin \sqrt{x} + \cos \sqrt{x}\right) + c$

(25) $\int e^{\sqrt{x}} dx =$

(1) $2\sqrt{x}(1 - e^{\sqrt{x}}) + c$

(2) $2\sqrt{x}(e^{\sqrt{x}} - 1) + c$

(3) $2e^{\sqrt{x}}(1 - \sqrt{x}) + c$

(4) $2e^{\sqrt{x}}(\sqrt{x} - 1) + c$