Socrative

(1) $\int \frac{8x^2}{1-2x}\,dx$

(2) $\int \frac{2}{2x-x^2}\,dx$

(3) $\int \frac{2x^2}{\sqrt{2x^3+1}}\,dx$

(4) $\int \frac{4-3x}{x+2}\,dx$

(5) $\int \frac{1-\cos x}{1+\cos x}\,dx$

(6) $\int x^2 e^{-x}\,dx$

(7) $\int \frac{3x-1}{2x+3}\,dx$

(8) $\int \sqrt{\sin^2 x+(\cos x-1)^2}\,dx$

(9) $\int \frac{1}{x^2-4}\,dx$

(10) $\int e^x \cos x\,dx$

(11) $\int \frac{2x^2+5x-1}{x^3+x^2-2x}\,dx$

(12) $\int \frac{4x-3}{3x-4}\,dx$

(1) $= -\frac{1}{2}(1-2x)^2 + 2(1-2x) - \ln|1-2x| + C = -2x^2 - 2x - \ln|1-2x| + C$

(2) $= \ln\left|\frac{x}{2-x}\right| + C$

(3) $= \frac{2}{3}(2x^3+1)^{\frac{1}{2}} + C$

(4) $= 10\ln|x+2| - 3(x+2) + C$

(5) $= 2\tan\left(\frac{x}{2}\right) - x + C = -2\cot x - x + 2\operatorname{cosec} x + C$

(6) $= -e^{-x}(x^2+2x+2) + C$

(7) $= \frac{3}{4}(2x-3) - \frac{11}{4}\ln|2x+3| + C = \frac{3}{2}x - \frac{11}{4}\ln|2x+3| + C$

(8) $= -4\cos\left(\frac{x}{2}\right) + C$

(9) $= \frac{1}{4}\ln\left|\frac{x-2}{x+2}\right| + C$

(10) $= \frac{1}{2}e^x(\cos x + \sin x) + C$

(11) $= 2\ln|x-1| + \frac{1}{2}\ln\left|\frac{x}{x+2}\right| + C$

(12) $= \frac{4}{9}(3x-4) + \frac{7}{9}\ln|3x-4| + C$

(1) $\int \frac{1}{\sin x \cos x}\, dx$

(2) $\int_{\sqrt{2}}^{2} \frac{\sqrt{x^2-1}}{x}\, dx$ use $x = \operatorname{cosec}\theta$

(3) $\int x^2 e^{-\frac{1}{4}x}\, dx$

(4) $\int_{-\frac{3}{2}}^{-\frac{1}{2}} \frac{5x-2}{2x-5}\, dx$

(5) $\int \frac{x+4}{x-4}\, dx$

(6) $\int_{0}^{\frac{\pi}{2}} x \sin 2x\, dx$

(7) $\int_{0}^{2} \sqrt{16-x^2}\, dx$ use $x = 4\sin\theta$

(8) $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} (\sin x + \cot x)^2\, dx$

(9) $\int \frac{4x^3\sqrt{x^4+1}}{1+\sqrt{x^4+1}}\, dx$

(10) $\int_{0}^{2} \frac{4x^3-12x^2-22x-3}{(4-x)(2x+1)}\, dx$

(11) $\int_{0}^{\frac{\pi}{4}} (\cos x + \sec x)^2\, dx$

(12) $\int_{2}^{3} \frac{x^2-3x+5}{(4-x)(1-x)^2}\, dx$

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(1) $= -\frac{1}{2}\ln\left|\operatorname{cosec} 2x + \cot 2x\right| + C = \ln\left|\tan x\right| + C$

(2) $= \sqrt{3} - 1 - \frac{\pi}{12},$

(3) $= -4e^{-\frac{1}{4}x}\left(x^2 + 8x + 32\right) + C$

(4) $= \frac{5}{2} + \frac{21}{4}\ln\left(\frac{3}{4}\right)$

(5) $= x + 8\ln\left|x - 4\right| + C$

(6) $= \frac{\pi}{4}$

(7) $= \frac{1}{3}\left(4\pi + 6\sqrt{3}\right),$

(8) $= \frac{1}{8}\left(26 - \pi - 4\sqrt{2}\right)$

(9) $= x^4 - 2\sqrt{x^4 + 1} + 2\ln\left|1 + \sqrt{x^4 + 1}\right| + C$

(10) $= \frac{1}{2}\ln\left(\frac{5}{64}\right) - 6$

(11) $= \frac{5}{8}(\pi + 2)$

(12) $= \frac{1}{2} + \ln 2$