① $\int \sqrt{x-2}\,dx$

$\frac{2}{3}(x-2)^{3/2}+c$

② $\int (2x+3)^{12}\,dx$

$\frac{1}{2}\int (2x+3)^{12}\,2dx$

$\frac{1}{26}(2x+3)^{13}+c$

③ $\int \sqrt{3t+2}\,dt$

$\frac{1}{3}\int \sqrt{3t+2}\cdot 3dt$

$\frac{2}{9}(3t+2)^{3/2}+c$

④ $\int (2x+3)^{43}\,dx$

$\frac{1}{2}\int (2x+3)^{43}\cdot 2dx$

$\frac{1}{88}(2x+3)^{44}+c$

⑤ $\int 3(4x-5)^{2/3}\,dx$

$\frac{3}{4}\int (4x-5)^{2/3}\cdot 4\,dx$

$\frac{9}{20}(4x-5)^{5/3}+c$

⑥ $\int 2(3-5x)^{3/5}\,dx$

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

$-\frac{1}{4}(3-5x)^{8/5}+c$

⑦ $\int \sqrt[3]{4x+7}\,dx$

$\frac{1}{4}\int (4x+7)^{1/3}\,4dx$

$\frac{3}{16}(4x+7)^{4/3}+c$

⑧ $\int \frac{dx}{(2x-3)^4}$

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

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

⑨ $\int y(y^2+4)^{2/3}\,dy$

$\frac{1}{2}\int 2y(y^2+4)^{2/3}\,dy$

$\frac{3}{10}(y^2+4)^{5/3}+c$

⑩ $\int 5x(1-x^2)^{1/2}\,dx$

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

$-\frac{5}{3}(1-x^2)^{3/2}+c$

⑪ $\int x\sqrt{2x^2+7}\,dx$

$\frac{1}{4}\int (2x^2+7)^{1/2}\,4x\,dx$

$\frac{1}{6}(2x^2+7)^{3/2}+c$

⑫ $\int x^2\sqrt{2x^3-7}\,dx$

$\frac{1}{6}\int 6x^2(2x^3-7)^{1/2}\,dx$

$\frac{1}{9}(2x^3-7)^{3/2}+c$

⑬ $\int 5x^3(3-2x^3)^{1/3}\,dx$

$-\frac{5}{6}\int -6x^2(3-2x^3)^{1/3}\,dx$

$-\frac{5}{8}(3-2x^3)^{4/3}+c$

⑭ $\int x^3\sqrt{x^4-16}\,dx$

$\frac{1}{4}\int 4x^3\sqrt{x^4-16}\,dx$

$\frac{1}{6}(x^4-16)^{3/2}+c$

⑮ $\int \frac{t\,dt}{\sqrt{3t^2+1}}$

$\frac{1}{6}\int 6t(3t^2+1)^{-1/2}\,dt$

$\frac{1}{3}(3t^2+1)^{1/2}+c$

$\frac{1}{3}\sqrt{3t^2+1}+c$

⑯ $\int x^{1/3}\left(x^{4/3}+81\right)^6\,dx$

$\frac{3}{4}\int \frac{4}{3}x^{1/3}\left(x^{4/3}+81\right)^6\,dx$

$\frac{3}{28}\left(x^{4/3}+81\right)^7+c$

⑰ $\int \sqrt{1+\sqrt{x}}\,\frac{dx}{\sqrt{x}}$

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

$\frac{4}{3}(1+\sqrt{x})^{3/2}+c$

(18) $\int x^{-1/2}\left(x^{1/2}+2\right)^{1/5}dx$

$2\int \frac{1}{2}x^{-1/2}\left(x^{1/2}+2\right)^{1/5}dx$

$\frac{10}{6}\left(x^{1/2}+2\right)^{6/5}+c$

(19) $\int x^6\left(3x^2+1\right)^{15}dx$ $\quad u=3x^2+1$

$du=6x\,dx$

CBDY

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

$\frac{2}{3}\left(x^2+x-3\right)^{3/2}+c$

(21) $\int (x+5)\sqrt{x^2+10x+24}\,dx$

$\frac{1}{2}\int 2(x+5)\left(x^2+10x+24\right)^{1/2}dx$

$\frac{1}{3}\left(x^2+10x+24\right)^{3/2}+c$

(22) $\int \left(x^6-7x^4+2\right)^{20}dx$

CBDY

(23) $\int \left(\sqrt[3]{x^2}+3\right)^5\frac{dx}{\sqrt[3]{x}}$

$\frac{3}{2}\int \frac{2}{3}x^{-1/3}\left(x^{2/3}+3\right)^5dx$

$\frac{1}{4}\left(x^{2/3}+3\right)^6+c$

(24) $\int \left(\left(x+1\right)^5-2\right)^6\left(x+1\right)^4dx$

$\frac{1}{5}\int \left(\left(x+1\right)^5-2\right)^6 5\left(x+1\right)^4dx$

$\frac{1}{35}\left(\left(x+1\right)^5-2\right)^7+c$

(25) $\int \sqrt{x}\left(\sqrt{x}+2\right)^{199}dx$

$u=\sqrt{x}+2$

$u-2=\sqrt{x}$

$du=\frac{1}{2}x^{-1/2}dx$

$2x^{1/2}du=dx$

$2(u-2)du=dx$

$\int (u-2)u^{199}\cdot 2(u-2)\,du$

$2\int \left(u^{201}-4u^{200}+4u^{199}\right)du$

$\frac{1}{101}u^{202}-\frac{8}{201}u^{201}+\frac{1}{25}u^{200}+c$

$\frac{1}{101}\left(\sqrt{x}+2\right)^{202}-\frac{8}{201}\left(\sqrt{x}+2\right)^{201}+\frac{1}{25}\left(\sqrt{x}+2\right)^{200}+c$

(26) $\int \sqrt[4]{\left(\sqrt{x}-1\right)^3+2}\,\left(\sqrt{x}-1\right)^2\frac{dx}{\sqrt{x}}$

$\frac{2}{3}\int \sqrt[4]{\left(\sqrt{x}-1\right)^3+2}\cdot\frac{3}{2}x^{-1/2}\left(\sqrt{x}-1\right)^2dx$

$\frac{8}{15}\left(\left(\sqrt{x}-1\right)^3+2\right)^{5/4}+c$

(27) $\int \frac{x-5}{\sqrt{x+2}}dx$ $\quad u=x+2$ $\quad x=u-2$

$du=dx$

$\int \frac{u-7}{u^{1/2}}du$

$\int \left(u^{1/2}-7u^{-1/2}\right)du$

$\frac{2}{3}u^{3/2}-14u^{1/2}+c$

$\frac{2}{3}(x+2)^{3/2}-14(x+2)^{1/2}+c$

(28) $\int (x+1)(x-2)\,dx$

$\int (x^2 - x - 2)\,dx$

$\frac{1}{3}x^3 - \frac{1}{2}x^2 - 2x + c$

(29) $\int \frac{5x^3 - 10x^2 + 15}{5x^4}\,dx$

$\int (x^{-3} - 2x^{-4} + 3x^{-6})\,dx$

$-\frac{1}{2}x^{-2} + \frac{2}{3}x^{-3} - \frac{3}{5}x^{-5} + c$

(30) $\int \frac{dx}{(x-5)^3}$

$-\frac{1}{2}(x-5)^{-2} + c$