① $\int (4x^3 + x^2)\,dx$

$\int 4x^3\,dx + \int x^2\,dx$

$4\int x^3 + \frac{x^3}{3}$

$\frac{4 \cdot x^4}{4} + \frac{x^3}{3}$

$\boxed{x^4 + \frac{x^3}{3} + C}$

② $\int \sqrt{x}\,(x+1)\,dx$

$\int \sqrt{x^2} + \sqrt{x}\,dx$

$\int x^{\frac{1}{2}} \cdot x + x^{\frac{1}{2}}\,dx$

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

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

$\boxed{\frac{2x^2\sqrt{x}}{5} + \frac{2x\sqrt{x}}{3} + C}$

③ $\int (5\cos x - 4\operatorname{sen} x)\,dx$

③ $\int (5\cos x - 4\operatorname{sen} x)\, dx$

$\int 5\cos x\, dx - \int 4\operatorname{sen} x\, dx$

$5\int \cos x\, dx - 4\int \operatorname{sen} x\, dx$

$5\operatorname{sen} x + 4\cos x + C$

$5 \operatorname{sen} x + 4 \cos x + C$

④ $\int 6t^2 \sqrt[3]{t}\, dt$

$\int 6t^2 \cdot t^{\frac{1}{3}}\, dt$

$\int 6t^{\frac{7}{3}}\, dt$

$6 \int t^{\frac{7}{3}}\, dt$

$6 \cdot \frac{t^{\frac{7}{3}+1}}{\frac{7}{3}+1} + C$

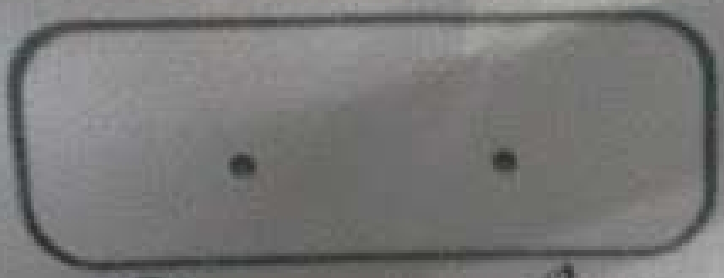
$6 \cdot \frac{t^{\frac{10}{3}}}{\frac{10}{3}} + C$

$6 \cdot \frac{3}{10} t^{\frac{10}{3}} + C$

$\frac{18}{10} t^{\frac{10}{3}} + C$

$\frac{9}{5} t^{\frac{10}{3}} + C$

$\frac{9}{5} \cdot t^{\frac{10}{3}} + C$



(4) $9\sqrt[3]{t^{10}} + C$

5

$$\frac{9t^3\sqrt[3]{t}}{5} + C$$

(5) $\int_{-2}^{3} x^{-5} = \int_{-2}^{3} \frac{1}{x^5}\,dx = \left[\frac{1}{4x^4} \right]_{-2}^{3}$

$\frac{1}{4 \cdot 3^4} + \frac{1}{4 \cdot -2^4}$

$\frac{1}{324} + \frac{1}{-64}$

$\frac{1}{324} + \left(-\frac{1}{64}\right)$

$\frac{1}{324} - \frac{1}{64} = -\frac{65}{5184}$

⑥ $\int_0^1 (3 + x\sqrt{x})\,dx$

$\int (3 + x\sqrt{x})\,dx$

$3x + \int x\sqrt{x}\,dx$

$3x + \int x \cdot x^{\frac{1}{2}}\,dx$

$3x + \int x^{\frac{3}{2}}\,dx$

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

$3x + \frac{x^{\frac{5}{2}}}{\frac{5}{2}} = 3 + \frac{2x^{\frac{5}{2}}}{5}$

$3x + \frac{2\sqrt{x^5}}{5} = 3 + \frac{2\sqrt{x^4}\cdot\sqrt{x}}{5}$

$3x + \frac{2x^{\frac{4}{2}}\cdot\sqrt{x}}{5}$

$3x + \frac{2x^2\sqrt{x}}{5}$

$3 + \frac{2\sqrt{1}}{5} \quad \left|\begin{matrix} 2 \\ 1 \end{matrix}\right. \quad 3 + \frac{2\sqrt{0}}{5}$

$3 + \frac{2}{5} \quad \left|\begin{matrix} 2 \\ 1 \end{matrix}\right. \quad 3 + 0$

$\frac{17}{5} - 3 = \frac{15-17}{5}$

$-\frac{2}{5}$

$\frac{3x + 2x\sqrt{x}}{5} \quad \left|\begin{matrix} 1 \\ 0 \end{matrix}\right.$

$\left(\frac{3.1 - 2.0\sqrt{0}}{5}\right) + \left(3.0 + \frac{2.1\sqrt{1}}{5}\right)$

$3 + \frac{2}{5} = \frac{17}{5}$

7) $\int_0^{\frac{\pi}{2}} \frac{\operatorname{sen} x}{5}\, dx$

$\frac{1}{5}\int_0^{\frac{\pi}{2}} \operatorname{sen} x\, dx$

$\frac{1}{5} \cdot \underline{\cos(x)} \cdot = \Big|_0^{\pi/2} \quad \frac{\cos \frac{\pi}{2}}{5} - \frac{\cos 0}{5}$

$0 + \frac{1}{5} = \frac{1}{5}$

(8) $\int_0^1 (x - 2e^x)$

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

$\int x \cdot dx - \int 2e^x\, dx$

$\frac{x^2}{2} - 2e^x$

$\left(\frac{1^2}{2} + 2e^0\right) - \left(\frac{0^2}{2} + 2e^1\right)$

$\left(\frac{1}{2} + 2\right) - 2e$

$\frac{1}{2} - 2e + 2 = \boxed{\frac{5}{2} - 2e}$