

$$①) \int x^4 dx = \frac{x^5}{5} + C$$

$$b) \int x^6 dx = \frac{x^7}{7} + C$$

$$c) \int x^{-3+1} dx = \frac{x^{-2+1}}{-2+1} = \frac{x^{-1}}{-1} + C = -\frac{1}{x} + C$$

$$d) \int x^{-5+1} dx = \frac{x^{-4+1}}{-4+1} = \frac{x^{-3}}{-3} + C = -\frac{1}{3x^3} + C$$

$$e) \int x^{\frac{2}{3}} dx = \frac{x^{\frac{2}{3}+1}}{\frac{2}{3}+1} = \frac{x^{\frac{5}{3}}}{\frac{5}{3}} = \frac{3}{5} \cdot x^{\frac{5}{3}} = \boxed{\frac{3x^{\frac{5}{3}}}{5} + C} \quad \text{or} \quad \boxed{\frac{3\sqrt[3]{x^5}}{5} + C}$$

$$f) \int x^{\frac{5}{3}} dx = \frac{x^{\frac{5}{3}+1}}{\frac{5}{3}+1} = \frac{x^{\frac{8}{3}}}{\frac{8}{3}} = \frac{3}{8} \cdot x^{\frac{8}{3}} = \frac{3x^{\frac{8}{3}}}{8} + C$$

$$g) \int x^{-\frac{3}{2}} dx = \frac{x^{-\frac{3}{2}+1}}{-\frac{3}{2}+1} = \frac{x^{-\frac{1}{2}}}{-\frac{1}{2}} = -2x^{-\frac{1}{2}} + C = -\frac{2}{\sqrt{x}} + C$$

$$h) \int x^{\frac{3}{5}} dx = \frac{x^{\frac{3}{5}+1}}{\frac{3}{5}+1} = \frac{x^{\frac{8}{5}}}{\frac{8}{5}} = \frac{5}{8} x^{\frac{8}{5}} + C$$

$$i) \int 9x^5 dx = \frac{9x^{5+1}}{5+1} = \frac{9x^6}{6} = \frac{3x^6}{2} + C$$

$$j) \int 3x^{-4} dx = \frac{3x^{-4+1}}{-4+1} = \frac{3x^{-3}}{-3} = -x^{-3} + C = -\frac{1}{x^3} + C$$

$$k) \int \sqrt{x^8} dx = \int x^4 dx = \frac{x^5}{5} + C$$

$$l) \int \sqrt[4]{x^3} dx = \int x^{\frac{3}{4}} dx = \frac{x^{\frac{3}{4}+1}}{\frac{3}{4}+1} = \frac{x^{\frac{7}{4}}}{\frac{7}{4}} = \frac{4x^{\frac{7}{4}}}{7} + C$$

$$m) \int \left(\frac{\sqrt[3]{x^5}}{\sqrt{x^8}} - \frac{4\sqrt{x^3}}{\sqrt{x^8}} \right) dx$$

$$\int \left(\frac{x^{\frac{5}{3}}}{x^{\frac{8}{2}}} - \frac{4x^{\frac{3}{2}}}{x^{\frac{8}{2}}} \right) dx$$

$$\frac{x^{\frac{5}{3}}}{x^4} - \frac{4x^{\frac{3}{2}}}{x^4}$$

$$\frac{x^{\frac{5}{3}}}{x^{\frac{12}{3}}} - \frac{4x^{\frac{3}{2}}}{x^{\frac{8}{2}}}$$

$$x^{\frac{5}{3}-4} - 4x^{\frac{3}{2}-4}$$

$$x^{\frac{5}{3}-\frac{12}{3}} - 4x^{\frac{3}{2}-\frac{8}{2}}$$

$$x^{\frac{5}{3}-4} - 4x^{\frac{3}{2}-4}$$

$$\frac{x^{\frac{5}{3}-4}}{\frac{5}{3}-4} - \frac{4x^{\frac{3}{2}-4}}{\frac{3}{2}-4}$$

$$\frac{x^{\frac{20}{3}-12}}{\frac{20}{3}-12} - \frac{4x^{\frac{3}{2}-8}}{\frac{3}{2}-8} \Rightarrow \frac{x^{\frac{20}{3}-12}}{\frac{20}{3}-12} + C - \frac{4x^{\frac{3}{2}-8}}{\frac{3}{2}-8} + C$$

$$n) \int \frac{x+1}{x^5} dx$$

$$\int (x+1) \cdot x^{-5} dx$$

$$\int (x \cdot x^{-5} + 1 \cdot x^{-5}) dx$$

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

$$\int x^{-4} dx + \int x^{-5} dx$$

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