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

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

$$c) \int \sqrt[3]{x} dx = \frac{x^{\frac{1}{3}+1}}{\frac{1}{3}+1} + K = \frac{x^{\frac{4}{3}}}{\frac{4}{3}} + K = \frac{3}{4} x \sqrt[3]{x} + K$$

$$d) \int \frac{1}{\sqrt{x}} dx = \int x^{-1/2} dx = \frac{x^{-1/2+1}}{-1/2+1} + K = \frac{\sqrt{x}}{1/2} + K = 2\sqrt{x} + K$$

$$e) \int \frac{1}{\sqrt[5]{x^2}} dx = \int x^{-2/5} dx = \frac{x^{-2/5+1}}{-2/5+1} + K = \frac{x^{3/5}}{3/5} + K = \frac{5\sqrt[5]{x^3}}{3} + K$$

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

$$g) \int \frac{5}{6x^4} dx = \frac{5}{6} \int x^{-4} dx = \frac{5}{6} \frac{x^{-4+1}}{-4+1} = \frac{5}{6} \frac{x^{-3}}{-3} + K = -\frac{5}{18x^3} + K$$

$$h) \int \frac{\sqrt[3]{2x}}{\sqrt{3x}} dx = \int \frac{\sqrt[3]{2}}{\sqrt{3}} x^{\frac{1}{3}-\frac{1}{2}} dx = \int \frac{\sqrt[3]{2}}{\sqrt{3}} x^{-1/6} dx = \frac{\sqrt[3]{2}}{\sqrt{3}} \frac{x^{-1/6+1}}{-1/6+1} = \frac{\sqrt[3]{2}}{\sqrt{3}} \frac{x^{5/6}}{5/6} = \frac{6\sqrt[3]{2}}{5\sqrt{3}} x^{5/6}$$

$$i) \int \frac{\sqrt[3]{x} + \sqrt{5x^3}}{3x} dx = \int \left[\frac{1}{3} x^{\frac{1}{3}-1} + \sqrt{5} x^{\frac{3}{2}-1} \right] dx = \frac{1}{3} \frac{x^{\frac{1}{3}-1}}{\frac{1}{3}-1} + \sqrt{5} \frac{x^{\frac{3}{2}-1}}{\frac{3}{2}-1} = \frac{1}{3} \frac{x^{-2/3}}{-2/3} + \sqrt{5} \frac{x^{1/2}}{1/2} = -\frac{1}{2} \frac{x^{-2/3}}{1} + 2\sqrt{5} \sqrt{x} = -\frac{1}{2} x^{-2/3} + 2\sqrt{5} \sqrt{x}$$

$$j) \int (\sqrt{5x-3})^4 dx = \int \frac{(\sqrt{5x-3})^5}{5} = \frac{1}{5} \left[\frac{3}{5} \sqrt[5]{x} + \frac{2}{3} \sqrt{5} x \sqrt{x} \right] = \frac{3}{25} \sqrt[5]{x} + \frac{2\sqrt{5}}{15} x \sqrt{x} + K$$

$$k) \int \sqrt[3]{(7x-6)^2} dx = \int (7x-6)^{2/3} dx = \frac{1}{\frac{2}{3}+1} \frac{(7x-6)^{\frac{2}{3}+1}}{\frac{2}{3}+1} + K = \frac{3}{5} \frac{(7x-6)^{5/3}}{7} + K = \frac{3}{35} (7x-6)^{5/3} + K$$

$$l) \int \frac{5x^3 + 6x^2 \sqrt{2} x + \sqrt{3}}{x} dx = \int (5x^2 + 6\sqrt{2} x + \sqrt{3} x^{-1}) dx = \frac{5}{3} x^3 + \frac{6\sqrt{2}}{2} x^2 + \sqrt{3} \ln|x| + K$$

$$m) \int \frac{2x^4 - 6x^3 + 5x}{x+2} dx$$

$$\left(2x^3 - 10x^2 + 20x - 35 + \frac{70}{x+2} \right) dx$$

$$\left(x^4 - \frac{10x^3}{3} + \frac{20x^2}{2} - 35x + 70 \ln|x+2| + k \right)$$

$$\begin{array}{r} 2x^4 - 6x^3 + 5x \\ - (2x^4 + 4x^3) \\ \hline -10x^3 + 5x \\ + 10x^3 + 20x^2 \\ \hline 20x^2 + 5x \\ - (20x^2 + 40x) \\ \hline -35x + 70 \end{array}$$

$$\begin{array}{r} x+2 \\ 2x^3 - 10x^2 \\ \hline 2x^3 - 10x^2 + 20x - 35 \\ \hline 20x - 35 \end{array}$$

$$n) \int \frac{5dx}{6-4x} = \int \frac{5dx}{-4x+6} = -\frac{5}{4} \ln|4x+6| + dx$$

$$\begin{array}{r} 2x^4 + 6x - 3 \\ \hline 2x^3 + 4x^2 + 8x + 22 + \frac{41}{x-2} \end{array}$$

$$\bar{n}) \int \frac{2x^4 + 6x - 3}{x-2} dx$$

$$\left(2x^3 + 4x^2 + 8x + 22 + \frac{41}{x-2} \right) dx =$$

$$= \left(\frac{x^4}{2} + \frac{4}{3}x^3 + 4x^2 + 22x + 41 \ln|x-2| \right) + k$$

$$o) \int \frac{7x^4 - 5x^2 + 3x - 4}{x^2} dx$$

$$\int \left(7x^2 - 5 + \frac{3}{x} - \frac{4}{x^2} \right) dx =$$

$$\frac{7x^3}{3} - 5x + 3 \ln|x| - \frac{4}{x} + k$$

$$\int \frac{4}{x^2} dx = \int 4x^{-2} dx$$

$$4 \frac{x^{-2+1}}{-2+1} = \frac{4x^{-1}}{-1}$$