

$$1) \int \left(\frac{3}{x^5} + \frac{8}{\sqrt[6]{x^5}} - \frac{1}{x^2} \right) dx$$

$$\int 3x^{-5} + 8x^{-5/6} - x^{-2} dx$$

$$-\frac{3}{4}x^{-4} + \frac{48}{11}x^{1/6} - x^{-1} + C$$

$$-\frac{3}{4x^4} + \frac{48}{11}x^{1/6} + \frac{1}{x} + C$$

$$2) \int y^3 \left(\sqrt{y} + \frac{1}{\sqrt[4]{y}} + \sqrt[5]{y^2} \right) dy$$

$$\int y^3 (y^{1/2} + y^{-1/4} + y^{2/5}) dy$$

$$\int y^{7/2} + y^{11/4} + y^{17/5} dy$$

$$\frac{2}{9}y^{9/2} + \frac{4}{15}y^{15/4} + \frac{5}{22}y^{22/5} + C$$

$$3) \int \frac{3t^7 - 5t^4 + 9t - 7}{t^3} dt$$

$$\int t^{-3} (3t^7 - 5t^4 + 9t - 7) dt$$

$$\int 3t^4 - 5t + 9t^{-2} - 7t^{-3} dt$$

$$\frac{3}{5}t^5 - \frac{5}{2}t^2 - 9t^{-1} + \frac{7}{2}t^{-2} + C$$

$$\frac{3}{5}t^5 - \frac{5}{2}t^2 - \frac{9}{t} + \frac{7}{2t^2} + C$$

$$4) \int \frac{x^3 + 5x^2 - 6x + 1}{\sqrt[3]{x^2}} dx$$

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

$$\int x^{7/3} + 5x^{4/3} - 6x^{1/3} + x^{-2/3} dx$$

$$\frac{3}{10}x^{10/3} + \frac{15}{7}x^{7/3} - \frac{9}{2}x^{4/3} + 3x^{1/3} + C$$

$$5) \int (\cos \theta + 5 \sin \theta) d\theta$$

$$\sin \theta - 5 \cos \theta + C$$

$$6) \int (\sec^2 \theta + \csc^2 \theta) d\theta$$

$$\tan \theta - \cot \theta + C$$

$$7) \int \left(7 \sec x \tan x + \frac{3x}{\sqrt[7]{x^4}} - \frac{1}{\sqrt[4]{x^3}} + 2 \right) dx$$

$$\int 7 \sec x \tan x + 3x \cdot x^{-4/7} - x^{-3/4} + 2 dx$$

$$\int 7 \sec x \tan x + 3x^{3/7} - x^{-3/4} + 2 dx$$

$$7 \sec x + \frac{21}{10} x^{10/7} - 4 x^{1/4} + 2x + C$$

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

$$\int x^4 (3x^{-3} + 3x \cdot x^{-1/2} + 5x^4 - 2x^{-4}) dx$$

$$\int x^4 (3x^{-3} + 3x^{1/2} + 5x^4 - 2x^{-4}) dx$$

$$\int 3x + 3x^{9/2} + 5x^8 - 2 dx$$

$$\frac{3}{2} x^2 + \frac{6}{11} x^{11/2} + \frac{5}{9} x^9 - 2x + C$$

$$9) \int \left(\frac{x^2 \sin x - 3x^5 + \sqrt[6]{x^5} + \frac{1}{\sqrt[3]{x}}}{x^2} \right) dx$$

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

$$\int \sin x - 3x^3 + x^{-7/6} + x^{-4/3} dx$$

$$-\cos x - \frac{3}{4} x^4 - 6 x^{-1/6} - \frac{3}{4} x^{-1/3} + C$$

$$-\cos x - \frac{3}{4} x^4 - \frac{6}{x^{1/6}} - \frac{3}{4 x^{1/3}} + C$$

$$10) \int (x+4)^3 dx$$

$$\int (x+4)(x^2+8x+16) dx$$

$$\int x^3 + 8x^2 + 16x + 4x^2 + 32x + 64 dx$$

$$\int x^3 + 12x^2 + 48x + 64 dx$$

$$\frac{1}{4} x^4 + 4x^3 + 24x^2 + 64x + C$$

$$11) \int \left(\frac{12}{x^4} - 16x^7 + \cot x \csc x + 5\sqrt[3]{x^2} \right) dx$$

$$\int 12x^{-4} - 16x^7 + \cot x \csc x + 5x^{2/3} dx$$

$$-4x^{-3} - 2x^8 - \csc x + 3x^{5/3} + C$$

$$-\frac{4}{x^3} - 2x^8 - \csc x + 3x^{5/3} + C$$

$$12) \int \left(\frac{(x^2 - 6x)^2}{x^{3/8}} \right) dx$$

$$\int x^{-3/8} (x^4 - 12x^3 + 36x^2) dx$$

$$\int x^{29/8} - 12x^{21/8} + 36x^{13/8} dx$$

$$\frac{8}{37} x^{37/8} - \frac{96}{29} x^{29/8} + \frac{96}{7} x^{21/8} + C$$