

$$A) \int 3x^4 dx \rightarrow \frac{3x^{4+1}}{4+1} \rightarrow \frac{3x^5}{5} + C$$

$$B) \int 2x^7 dx \rightarrow \frac{2x^{7+1}}{7+1} \rightarrow \frac{2x^8}{8} = \frac{x^8}{4} + C$$

$$C) \int \frac{1}{x^3} dx \Rightarrow \int x^{-3} dx \Rightarrow \frac{x^{-3+1}}{-3+1}$$

~~$\frac{9x}{x^{-5}} = \frac{x^8}{4} + C$~~
 ~~$\frac{14x}{x^{12}} = x^{-3}$~~

$$E) \int \frac{3}{5} x^6 dx = \frac{3}{5} \int x^6 dx$$

$$\frac{3}{5} \cdot \frac{x^{6+1}}{6+1} = \frac{3x^7}{5 \cdot 7} = \frac{3x^7}{35} + C$$

$$F) \int \frac{t^{-5+1}}{-5+1} = \frac{3}{-4} t^{-4} = -\frac{3}{4+4} + C$$

$$G) \int 5u^{3/2} du$$

$$5 \int u^{3/2} du \Rightarrow 5 \cdot \frac{u^{3/2+3/2}}{3/2+3/2} = 5 \cdot \frac{u^{3/2}}{5}$$

$$\frac{5 \cdot u^{3/2}}{5} = u^{3/2} + C$$

8x4x7

$$\int 10 \sqrt[3]{x^2} dx = \int 10 x^{2/3} dx \Rightarrow 10 \int x^{2/3} dx$$

$$= (10) \frac{x^{2/3 + 3/3}}{2/3 + 3/3} = (10) \frac{x^{5/3}}{5/3} = \frac{30x^{5/3}}{5}$$

$$= 6x^{5/3} + C$$

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

$$= 2x^{2/3} \frac{2}{2/3} = \frac{6x^{2/3}}{2} = 3x^{2/3} + C$$

$$\int 6t^2 \sqrt[3]{t} dt$$

$$\int 6t^2 t^{1/3} dt = t^? = \frac{6}{?} + t^{?}$$

$$\int 6t^{2/3} dt \rightarrow 6 \int t^{2/3} dt$$

$$= (6) \frac{t^{2/3 + 3/3}}{2/3 + 3/3} = \frac{6t^{5/3}}{10/3} = \frac{18t^{5/3}}{10}$$

$$= 9/5 t^{5/3} + C$$

$$K) \int 7x^3 \sqrt{x} dx = \int 7x^3 \cdot x^{\frac{1}{2}} \cdot x^{\frac{1}{2}} dx = 7 \cdot \int x^{\frac{7}{2}} dx = 7 \cdot \frac{2}{9} x^{\frac{9}{2}} = \frac{14}{9} x^{\frac{9}{2}} + C$$

$$L) \int 4x^3 + x^2 dx = \int 4x^3 dx + \int x^2 dx$$

$$\int 4x^3 dx = x^4 = \int x^2 dy = \frac{y^3}{3}$$

$$M) \int 3u^3 - 2u^5 dx = \int 3u^2 du - \int 3u du$$

$$\int 3u^2 du = \frac{4u^3}{3} = \frac{4^3}{3} - \frac{4^4}{2} + C$$

$$\int 2u^3 dy = \frac{u^4}{2}$$

$$N) \int y^3 (2y^2 - y') dy$$

$$\frac{2y^5 - y^4}{5} \quad \int y^5 = 2 \cdot \frac{y^{5+1}}{5+1} = \frac{2y^6}{6} = \frac{y^6}{3}$$

$$\int \frac{y^{4+1}}{4+1} = \frac{y^5}{5}$$

$$\frac{2y^6}{6} - \frac{y^5}{5} + C$$

~~16.06.22~~

$$0) \int x^4 (5 - x^2) dx = 5x^4 - x^6 = \int 5x^4 dx - \int x^6 dx = x^5 \int x^6 dx = \frac{x^5}{7} + C$$

$$P) \int (3 - 2t + t^2) dt = 3t - t^2 + \frac{t^3}{3} + C$$

$$Q) \int \sqrt{x} (x+1) dx = \int x^{1/2} (x+1) dx$$

$$= \frac{1}{8} 14x \sqrt{x(x+1)} + 2 \sqrt{x(x+1)} - 2x + 1 + 2 \sqrt{x(x+1)} + C$$

$$R) \int (8x^4 + 4x^3 - 6x^2 - 8) dx$$

$$= \int 8x^4 dx + \int 4x^3 dx - \int 6x^2 dx - \int 8 dx$$

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

$$S) \int (2 + 3x^2 - 8x^3) dx$$

$$= \int 2 dx + \int 3x^2 dx - \int 8x^3 dx$$

$$= 2x + x^3 - 2x^4 + C$$

$$T) \int \sqrt[3]{x} (x+1) dx \quad 3x^{7/3}$$

$$\frac{3x^{7/3}}{7/3} + \frac{3x^{4/3}}{4/3} + C$$

$$v) \int (ax^2 + bx + c) dx$$

$$\frac{ax^3}{3} + \frac{bx^2}{2} + cx + C$$

$$vi) \int (\sqrt{x} - \frac{1}{\sqrt{x}}) dx$$

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

$$i) \int \sqrt{x^2} dx = \frac{x^2}{2} + C$$

$$ii) \int \sqrt[4]{x^3} dx$$

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

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

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

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

$$= \frac{3}{4} x^{4/3} + 3x^{-1/3} + C \Rightarrow \frac{\sqrt[3]{3x^4}}{2} + \sqrt[3]{3x} + C$$

$$iv) \int \sqrt[4]{2x} \, dx$$

$$\int 2x^{1/4} \, dx$$

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

$$= \frac{2x^{5/4}}{5/4}$$

$$= \frac{28x^{5/4}}{5} + C$$

$$= \frac{\sqrt[4]{28x^5}}{5} + C$$

$$vi) \int x^{-5/2} \, dx$$

$$= \frac{x^{-5/2+1}}{-5/2+1}$$

$$= \frac{x^{-3/2}}{-3/2}$$

$$= -\frac{2x^{-3/2}}{3} + C$$

$$= -\frac{2}{3\sqrt{x^3}} + C$$

A) $\int 2x^2 - \sqrt{3x^2 + 4x} dx$

$\int \frac{2x^3}{3} - \int \frac{3x}{7/2} - \int \sqrt{\frac{6x^2}{2}}$
 $\frac{2x^3}{3} - 2x^2 - \frac{2x^3}{3} - \sqrt{6x^2} + 2x^2 + C$

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

$\int 4x^3 dx = x^4 \int 2x^{1/2} dx = \frac{4}{3} x^{3/2}$
 $\int 5 \frac{3}{4} dx = 5 \frac{3}{4} x = x^4 + \frac{3}{5} x^{5/2} + \frac{3}{54} - \frac{7x^3}{3} + C$

C) $\int \sqrt[5]{3x^4} dx$

$\frac{3x^{4/5 + 5/5}}{4/5 + 5/5} = \frac{3x^{9/5}}{9/5} - \frac{5x}{3} = \frac{5\sqrt[5]{9x^9}}{3} + C$

D) $\int 8x^2 = \sqrt[4]{6x} dx$

$\int \frac{8x^3}{3} - \int \frac{6x^{3/4}}{5/4} - \int \frac{\sqrt[4]{24x^5}}{3}$
 $\frac{8x^3}{3} - \frac{\sqrt[4]{24x^5}}{5} + C$

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