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

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

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

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

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

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Q8- $\int \left(6e^x - \frac{3}{x^2}\right) dx$

$= \int 6e^x \, dx - \int 3x^{-2} \, dx$

$= \int 6e^x \, dx - 3 \int \frac{x^{-2+1}}{-2+1} \, dx$

Notes

$= 6e^x - 3 \cdot \frac{x^{-1}}{-1} + C$

$= 6e^x + \frac{3}{x} + C$ Ans

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Q:- $\int x^{\frac{3}{4}}\left(2x^{\frac{2}{3}}+6x^{\frac{1}{2}}\right)dx$

$= \int\left(2x^{\frac{17}{12}}+6x^{\frac{5}{4}}\right)dx$

$= 2\int\frac{x^{\frac{17}{12}+1}}{\frac{17}{12}+1}dx+6\int\frac{x^{\frac{5}{4}+1}}{\frac{5}{4}+1}dx$

$= 2\int\frac{x^{\frac{17+12}{12}}}{\frac{17+12}{12}}dx+6\int\frac{x^{\frac{5+4}{4}}}{\frac{5+4}{4}}dx$

$= 2\cdot\frac{x^{\frac{29}{12}}}{\frac{29}{12}}+6\cdot\frac{x^{\frac{9}{4}}}{\frac{9}{4}}+c$

$= \frac{2\cdot 12}{29}x^{\frac{29}{12}}+\frac{6\cdot 4}{9}x^{\frac{9}{4}}+c$

$= \frac{24}{29}x^{\frac{29}{12}}+\frac{8}{3}x^{\frac{9}{4}}+c$

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Q:- $\int \sqrt{x}\left(x^{\frac{2}{3}} + 2x^{\frac{1}{2}} + 5x\right) dx$

$= \int x^{\frac{1}{2}}\left(x^{\frac{2}{3}} + 2x^{\frac{1}{2}} + 5x\right) dx$

$= \int \left(x^{\frac{7}{6}} + 2x + 5x^{\frac{3}{2}}\right) dx$

$= \int \frac{x^{\frac{7}{6}+1}}{\frac{7}{6}+1} dx + 2\int \frac{dx^{1+1}}{1+1} dx + 5\int \frac{x^{\frac{3}{2}+1}}{\frac{3}{2}+1} dx$

$= \int \frac{x^{\frac{13}{6}}}{\frac{13}{6}} dx + 2\int \frac{x^2}{2} \cdot dx + 5\int \frac{x^{\frac{5}{2}}}{\frac{5}{2}} + C$

$= \frac{6}{13}x^{\frac{13}{6}} + \frac{2 \cdot x^2}{2} + \frac{5 \times 2}{5} x^{\frac{5}{2}} + C$

$= \frac{6}{13}x^{\frac{13}{6}} + x^2 + x^{\frac{5}{2}} + C$

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THURSDAY

Q. $\int (4x+2)(3+4x)\,dx$

$= \int (12x + 16x^2 + 6 + 8x)\,dx$

$= \int 16x^2 + 20x + 6\,dx$

$= 16\int x^2\,dx + 20\int x\,dx + 6\int dx$

$= 16\int \frac{x^{2+1}}{2+1}\,dx + 20\int \frac{x^{1+1}}{1+1}\,dx + 6x + C$

$= \frac{16}{3}x^3 + \frac{20}{2}\cdot\frac{x^2}{2} + 6x + C$

$= \frac{16}{3}x^3 + 10x^2 + 6x + C$

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