



Indefinite Integrals Ex 19.2 Q8

$$\begin{aligned}
 \int \left\{ x^2 + e^{\log x} + \left( \frac{e}{2} \right)^x \right\} dx \\
 &= \int x^2 dx + \int e^{\log x} dx + \int \left( \frac{e}{2} \right)^x dx \\
 &= \frac{x^3}{3} + \int x dx + \int \left( \frac{e}{2} \right)^x dx \\
 &= \frac{x^3}{3} + \frac{x^2}{2} + \frac{1}{\log \left( \frac{e}{2} \right)} \times \left( \frac{e}{2} \right)^x + c
 \end{aligned}$$

Indefinite Integrals Ex 19.2 Q9

$$\begin{aligned}
 \int (x^e + e^x + e^e) dx \\
 &= \int x^e dx + \int e^x dx + \int e^e dx \\
 &= \frac{x^{e+1}}{e+1} + e^x + e^e x + c \quad [\because e \text{ is constant}]
 \end{aligned}$$

$$\therefore \int (x^e + e^x + e^e) dx = \frac{x^{e+1}}{e+1} + e^x + e^e x + c$$

Indefinite Integrals Ex 19.2 Q10

$$\begin{aligned}
 \int \sqrt{x} \left( x^3 - \frac{2}{x} \right) dx &= \int x^{\frac{7}{2}} dx - 2 \int x^{-\frac{1}{2}} dx \\
 &= \frac{x^{\frac{7}{2}+1}}{\frac{7}{2}+1} - 2 \frac{x^{-\frac{1}{2}+1}}{-\frac{1}{2}+1} + c \\
 &= \frac{x^{\frac{9}{2}}}{\frac{9}{2}} - \frac{2x^{\frac{-1}{2}}}{\frac{-1}{2}} + c \\
 &= \frac{2}{9} x^{\frac{9}{2}} - 4x^{-\frac{1}{2}} + c
 \end{aligned}$$

$$\therefore \int \sqrt{x} \left( x^3 - \frac{2}{x} \right) dx = \frac{2}{9} x^{\frac{9}{2}} - 4\sqrt{x} + c$$

Indefinite Integrals Ex 19.2 Q11

$$\begin{aligned}
 \int \frac{1}{\sqrt{x}} \left( 1 + \frac{1}{x} \right) dx \\
 &= \int \left( \frac{1}{\sqrt{x}} + \frac{1}{\sqrt{x} \times x} \right) dx \\
 &= \int x^{-\frac{1}{2}} + \int x^{-\frac{3}{2}} dx \\
 &= 2x^{\frac{1}{2}} - 2x^{-\frac{1}{2}} + c \\
 &= 2\sqrt{x} - \frac{2}{\sqrt{x}} + c
 \end{aligned}$$

$$\therefore \int \frac{1}{\sqrt{x}} \left( 1 + \frac{1}{x} \right) dx = 2\sqrt{x} - \frac{2}{\sqrt{x}} + c$$

Indefinite Integrals Ex 19.2 Q12

$$\begin{aligned}
 \int \frac{x^6 + 1}{x^2 + 1} dx \\
 &= \int \frac{(x^2)^3 + (1)^3}{x^2 + 1} dx \\
 &= \int \frac{(x^2 + 1)(x^4 + 1 - x^2)}{x^2 + 1} dx \\
 &= \int (x^4 - x^2 + 1) dx \\
 &= \int x^4 dx - \int x^2 dx + \int 1 dx \\
 &= \frac{x^5}{5} - \frac{x^3}{3} + x + c
 \end{aligned}$$

Indefinite Integrals Ex 19.2 Q13

$$\begin{aligned}
 \int \frac{x^{-\frac{1}{3}} + \sqrt{x} + 2}{\sqrt[3]{x}} dx \\
 &= \int \frac{x^{-\frac{1}{3}} dx}{x^{\frac{1}{3}}} + \int \frac{x^{\frac{1}{2}} dx}{x^{\frac{1}{3}}} + \int \frac{2}{x^{\frac{1}{3}}} dx \\
 &= \int x^{-\frac{2}{3}} dx + \int x^{\frac{1}{6}} dx + 2 \int x^{-\frac{1}{3}} dx \\
 &= 3x^{\frac{1}{3}} + \frac{6}{7} x^{\frac{7}{6}} + 3x^{\frac{2}{3}} + c
 \end{aligned}$$

Indefinite Integrals Ex 19.2 Q14

$$\int \frac{(1 + \sqrt{x})^2}{\sqrt{x}} dx$$

$$= \int \frac{1 + x + 2\sqrt{x}}{x^{\frac{1}{2}}} dx$$

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

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

$$\therefore \int \frac{(1 + \sqrt{x})^2}{\sqrt{x}} dx = 2\sqrt{x} + 2x + \frac{2}{3}x^{\frac{3}{2}} + c$$

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