



Indefinite Integrals Ex 19.2 Q1

$$\begin{aligned}
 & \int (3x\sqrt{5} + 4\sqrt{x} + 5) dx \\
 &= \int 3x\sqrt{5} dx + \int 4\sqrt{x} dx + \int 5 dx \\
 &= \int 3x^{\frac{3}{2}} dx + 4 \int x^{\frac{1}{2}} dx + 5 \int dx \\
 &= \frac{x^{\frac{3}{2}+1}}{\frac{3}{2}+1} + \frac{4x^{\frac{1}{2}+1}}{\frac{1}{2}+1} + 5x + c \\
 &= \frac{6}{5}x^{\frac{5}{2}} + \frac{8}{3}x^{\frac{3}{2}} + 5x + c
 \end{aligned}$$

Indefinite Integrals Ex 19.2 Q2

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

Indefinite Integrals Ex 19.2 Q3

$$\begin{aligned}
 & \int \left\{ \sqrt{x} (ax^2 + bx + c) \right\} dx \\
 &= \int \sqrt{x} \times ax^2 dx + \int \sqrt{x} \times bxdx + \int c\sqrt{x} dx \\
 &= \int ax^{\frac{5}{2}} dx + \int bx^{\frac{3}{2}} dx + \int cx^{\frac{1}{2}} dx \\
 &= \frac{ax^{\frac{5}{2}+1}}{\frac{5}{2}+1} + \frac{bx^{\frac{3}{2}+1}}{\frac{3}{2}+1} + \frac{cx^{\frac{1}{2}+1}}{\frac{1}{2}+1} + d \\
 &= \frac{2ax^{\frac{7}{2}}}{7} + \frac{2bx^{\frac{5}{2}}}{5} + \frac{2cx^{\frac{3}{2}}}{3} + d
 \end{aligned}$$

Indefinite Integrals Ex 19.2 Q4

$$\begin{aligned}
& \int (2 - 3x)(3 + 2x)(1 - 2x) \, dx \\
&= \int (6 + 4x - 9x - 6x^2)(1 - 2x) \, dx \\
&= \int (-6x^2 - 5x + 6)(1 - 2x) \, dx \\
&= \int (-6x^2 + 12x^3 - 5x + 10x^2 + 6 - 12x) \, dx \\
&= \int (4x^2 + 12x^3 - 17x + 6) \, dx \\
&= \int (12x^3 + 4x^2 - 17x + 6) \, dx \\
&= \frac{12}{4}x^4 + \frac{4}{3}x^3 - \frac{17}{2}x^2 + 6x + c \\
&= 3x^4 + \frac{4}{3}x^3 - \frac{17}{2}x^2 + 6x + c
\end{aligned}$$

Indefinite Integrals Ex 19.2 Q5

$$\begin{aligned}
& \int \left(\frac{m}{x} + \frac{x}{m} + m^x + x^m + mx \right) dx \\
&= m \int \frac{1}{x} dx + \frac{1}{m} \int x dx + \int m^x dx + \int x^m dx + m \int x dx \\
&= m \log|x| + \frac{x^2}{2m} + \frac{m^x}{\log m} + \frac{x^{m+1}}{m+1} + \frac{mx^2}{2} + c
\end{aligned}$$

Indefinite Integrals Ex 19.2 Q6

$$\begin{aligned}
& \int \left(\sqrt{x} - \frac{1}{\sqrt{x}} \right)^2 dx \\
&= \int \left(x + \frac{1}{x} - 2 \right) dx \\
&= \int x dx + \int \frac{1}{x} dx - 2 \int 1 dx \\
&= \frac{x^2}{2} + \log|x| - 2x + C
\end{aligned}$$

Indefinite Integrals Ex 19.2 Q7

$$\int \frac{(1+x)^3}{\sqrt{x}} dx$$

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

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

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

$$= \frac{x^{-\frac{1}{2}+1}}{-\frac{1}{2}+1} + \frac{x^{\frac{5}{2}+1}}{\frac{5}{2}+1} + \frac{3x^{\frac{3}{2}+1}}{\frac{3}{2}+1} + 3 \frac{x^{\frac{1}{2}+1}}{\frac{1}{2}+1} + c$$

$$= \frac{x^{\frac{1}{2}}}{\frac{1}{2}} + \frac{x^{\frac{7}{2}}}{\frac{7}{2}} + \frac{3x^{\frac{5}{2}}}{\frac{5}{2}} + 3 \frac{x^{\frac{3}{2}}}{\frac{3}{2}} + c$$

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

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

$$\therefore \int \frac{(1+x)^3}{\sqrt{x}} dx = 2x^{\frac{1}{2}} + \frac{2}{7}x^{\frac{7}{2}} + \frac{6}{5}x^{\frac{5}{2}} + 2x^{\frac{3}{2}} + c$$

***** END *****