

$$\int (\sqrt{x} + 2x + 3) dx = \int \sqrt{x} dx + 2 \int x dx + 3 \int dx =$$

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

$$\int x^n dx = \frac{x^{n+1}}{n+1} + C$$

$$= \frac{x^{\frac{1}{2}+1}}{\frac{1}{2}+1} + \cancel{2} \frac{x^2}{\cancel{2}} + 3x + C$$

$$= \frac{x^{\frac{1+2}{2}}}{\frac{1+2}{2}} + x^2 + 3x + C = \frac{x^{\frac{3}{2}}}{\frac{3}{2}} + x^2 + 3x + C$$

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

$$\int x^{\frac{m}{n}} = x^{\frac{m}{n}}$$

$$\sqrt[3]{x^4} = x^{\frac{4}{3}}$$

$$\sqrt[4]{x} = x^{\frac{1}{4}}$$

$$\int \frac{3x^4 + 4x^2}{\cancel{x^2}} dx = \int \frac{3x^{\cancel{4}^2}}{\cancel{x^2}} dx + \int \frac{4x^2}{\cancel{x^2}} dx = 3 \int x^2 dx + 4 \int dx$$

$$= \cancel{3} \frac{x^3}{\cancel{3}} + 4x + C$$

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

$$= 2 \int \left(\frac{1}{x} \right) dx - \int x^{-2} + \int x dx = 2 \ln|x| - \frac{x^{-1}}{-1} + \frac{x^2}{2} + C$$

$$= 2 \ln|x| + \frac{1}{x} + \frac{x^2}{2} + C$$

$\frac{1}{x^2} = x^{-2}$
 $\frac{3}{x^4} = 3x^{-4}$