

$$\int 6x^5 - 18x^2 + 2 dx = x^6 - 6x^3 + 2x + C$$

$$\int \frac{2x^3 + 5\sqrt{x} - 10}{x} dx$$

$$= \int 2x^2 dx + 5 \int x^{-\frac{1}{2}} dx - 10 \int \frac{1}{x} dx$$

$$= \frac{2}{3} x^3 + 10\sqrt{x} - 10 \ln|x| + C$$

$$\int \sin x + \cos x - e^x dx$$

$$= -\cos x + \sin x - e^x + C$$

$$\int x e^{x^2} dx$$

$$= \frac{1}{2} e^{x^2} + C \quad (\text{Use substitution } u = x^2)$$

$$\int_0^1 x^2 \sqrt{1+3x^3} dx \quad \text{set } u = 1+3x^3, \quad du = 9x^2 dx$$

$$= \frac{1}{9} \int_1^4 \sqrt{u} du = \frac{2}{27} u^{\frac{3}{2}} \Big|_1^4 = \frac{14}{27}$$

$$\int (36x^2 - 10)(12x^3 - 10x)^2 dx \quad \text{set } u = 12x^3 - 10x, \quad du = (36x^2 - 10) dx$$

$$= \int u^2 du = \frac{1}{3} u^3 + C = \frac{1}{3} (12x^3 - 10x)^3 + C$$

$$\int_0^{\frac{\pi}{6}} \frac{3 \cos(3t)}{\sqrt{16 - 2 \sin(3t)}} dt \quad \text{set } u = 16 - 2 \sin(3t), \quad du = -6 \cos(3t) dt$$

$$= \int_{16}^{14} -\frac{1}{2\sqrt{u}} du = \sqrt{16} - \sqrt{14}$$