$$f(x) = 6x^2 - 8x + 3 \quad (x \in \mathbb{R})$$

$$\int (6x^2 - 8x + 3)\, dx = 6 \cdot \int x^2\, dx - 8 \cdot \int x\, dx + 3 \cdot \int 1\, dx =$$

$$6 \cdot \frac{x^3}{3} - 8 \cdot \frac{x^2}{2} + 3 \cdot x + C =$$

$$\underline{\underline{2x^3 - 4x^2 + 3x + C}}$$

$$f(x) = \frac{x^2}{x^2+1} = \frac{x^2+1-1}{x^2+1} = 1 - \frac{1}{x^2+1}$$

$$\int 1 - \frac{1}{x^2+1}\, dx = x - \operatorname{arctg}(x) + C$$

$$f(x)\ \sqrt{x\sqrt{x\sqrt{x}}} = \sqrt[8]{x^4 \cdot x^2 \cdot x} = \sqrt[8]{x^7} = x^{\frac{7}{8}}$$

$$\int x^{\frac{7}{8}} = \frac{x^{15/8}}{15/8} + C$$

$$f(x) = \frac{\cos^2 x - 5}{1 + \cos 2x} = \frac{\cos^2 x - 5}{(\sin^2 x + \cos^2 x) + (\cos^2 x - \sin^2 x)} = \frac{\cos^2 x - 5}{2\cos^2 x} =$$

$$\int \frac{1}{2} - \frac{5}{2} \cdot \frac{1}{\cos^2 x}\, dx = \frac{1}{2} \cdot x - \frac{5}{2} \cdot \operatorname{tg}(x) + C$$

$$\int \frac{2x}{x^2+3}\,dx = \int \frac{(x^2+3)'}{x^2+3} = \ln(x^2+3)+C$$

$$\int \sin^3 x \cdot \cos x\,dx = \int \sin^3 x\,(\sin x)' = \frac{\sin^4 x}{4}+C$$

$$\int \frac{dx}{x\cdot \ln x} = \int \frac{1}{x\cdot \ln x}\,dx = \frac{\frac{1}{x}}{\ln x}\,dx = \int \frac{(\ln x)'}{\ln x}\,dx = \ln(\ln x)+C$$

$$\int \sin^3 x \cdot \cos^4 x\,dx = \int \sin x \cdot \sin^2 x \cdot \cos^4 x\,dx = \int \sin x \cdot (1-\cos^2 x)\cdot \cos^4 x\,dx =$$

$$\int \cos^4 x - \cos^6 x \cdot \sin x\,dx = \int \cos^4 x \cdot (\cos x)' - \cos^6 x \cdot (\cos x)'\,dx =$$

$$\frac{\cos^5 x}{5} - \frac{\cos^7 x}{7} + C$$

$$\int \sin^2 x\,dx = \int \frac{1-\cos 2x}{2} = \frac{x}{2} - \frac{1}{2}\cdot \int \cos 2x\,dx =$$

$$\frac{x}{2} - \frac{1}{2}\cdot \frac{\sin 2x}{2} = \frac{x}{2} - \frac{\sin 2x}{4} + C$$