

$$\int (2 - 3^x)^2 dx = \int (4 - 4 \cdot 3^x + 3^{2x}) dx = 4 \int dx - 4 \int 3^x dx + \int 9^x d(x) =$$

$$= 4x - 4 \cdot \frac{3^x}{\ln 3} + \frac{9^x}{\ln 9} + C$$

$$\int \cos(5x - 2) dx = \frac{1}{5} \int \cos(5x - 2) d(5x - 2) = \frac{1}{5} \sin(5x - 2) + C$$

$$\int \frac{x^3 dx}{1 - 2x^4} = -\frac{1}{8} \int \frac{d(1 - 2x^4)}{1 - 2x^4} = -\frac{1}{8} \ln|1 - 2x^4| + C$$

$$\int \frac{x^2 - 3\sqrt{x} + 1}{\sqrt[3]{x}} dx = \int x^{\frac{5}{3}} dx - 3 \int x^{\frac{1}{6}} dx + \int x^{-\frac{1}{3}} dx =$$

$$= \frac{3}{8} x^{\frac{8}{3}} - \frac{18}{7} x^{\frac{7}{6}} + \frac{3}{2} x^{\frac{2}{3}} + C$$

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

$$\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx = 2 \int \frac{e^{\sqrt{x}}}{2\sqrt{x}} dx = 2 \int e^{\sqrt{x}} d(\sqrt{x}) = 2e^{\sqrt{x}} + C$$

$$\int \left( \frac{1}{x} + \sqrt[4]{x} + 2 \right) dx = \int \frac{1}{x} dx + \int x^{\frac{1}{4}} dx + 2 \int dx = \ln|x| + \frac{4}{5} x^{\frac{5}{4}} + 2x + C$$

$$\int \left( \sin \frac{x}{2} - \cos \frac{x}{2} \right)^2 dx = \sqrt{2} \int \sin^2 \left( \frac{x - \pi}{2} \right) dx = \frac{\sqrt{2}}{2} \int (1 - \cos(x - \pi)) dx =$$

$$= \frac{\sqrt{2}}{2} \int dx - \frac{\sqrt{2}}{2} \int \cos(x - \pi) d(x - \pi) dx = \frac{\sqrt{2}}{2} x - \frac{\sqrt{2}}{2} \sin(x - \pi) + C =$$

$$= \frac{\sqrt{2}}{2} x + \frac{\sqrt{2}}{2} \sin x + C$$

$$\int \frac{dx}{\sqrt{9 - 4x^2}} = \frac{1}{2} \int \frac{d(2x)}{\sqrt{3^2 - (2x)^2}} = \arcsin \frac{2x}{3} + C$$