

$$\int \cos^3(2x) dx$$

$$\downarrow dx \leftarrow \frac{1}{2} d2x$$

$$\int \cos^3(2x) \frac{1}{2} d2x$$

$$\downarrow \int C f(x) dx = C \int f(x) dx$$

$$\frac{1}{2} \cdot \int \cos^3(2x) d2x$$

$$\downarrow 2x \leftarrow t$$

$$\frac{1}{2} \cdot \int \cos^3(t) dt$$

$$\downarrow \cos^3(t) \leftarrow \cos^2(t) \cdot \cos(t)$$

$$\frac{1}{2} \cdot \int \cos^2(t) \cdot \cos(t) dt$$

$$\downarrow \cos(t) dt \leftarrow d \sin(t)$$

$$\frac{1}{2} \cdot \int \cos^2(t) d \sin(t)$$

$$\downarrow \cos^2(t) \leftarrow 1 - \sin^2(t)$$

$$\frac{1}{2} \cdot \int (1 - \sin^2(t)) d \sin(t)$$

$$\downarrow \int (f(x) - g(x)) dx = \int f(x) dx - \int g(x) dx$$

$$\frac{1}{2} \cdot \left(\int 1 d \sin(t) - \int \sin^2(t) d \sin(t) \right)$$

$$\downarrow \sin(t) \leftarrow u$$

$$\frac{1}{2} \cdot \left(\int 1 du - \int u^2 du \right)$$

$$\downarrow \int 1 du = u$$

$$\frac{1}{2} \cdot \left(u - \int u^2 du \right)$$

$$\downarrow \int u^2 du = \frac{u^3}{3}$$

$$\frac{1}{2} \cdot \left(u - \frac{u^3}{3} \right)$$

$$\downarrow u \leftarrow \sin(t)$$

$$\frac{1}{2} \cdot \left(\sin(t) - \frac{\sin^3(t)}{3} \right)$$

$$\downarrow t \leftarrow 2x$$

$$\frac{1}{2} \cdot \left(\sin(2x) - \frac{\sin^3(2x)}{3} \right)$$