Answer key

The method: Substitution

Let u be the inside. Write du, rewrite the integral in u, integrate, then put u back.

$$\int \sin(3x)\,dx = -\frac{\cos(3x)}{3} + C$$

$u = 3x,\ du = 3\,dx$ divide by 3

$$-\frac{\cos(3x)}{3} + C$$

$$\int \frac{2x}{x^2+8}\,dx = \ln(x^2+8) + C$$

$u = x^2 + 8,\ du = 2x\,dx$ the top is the derivative of the bottom

$$\ln(x^2+8) + C$$

$$\int 2x(x^2+6)^5\,dx = \frac{(x^2+6)^6}{6} + C$$

$u = x^2 + 6,\ du = 2x\,dx$ let u be the inside

$$\frac{(x^2+6)^6}{6} + C$$ integrate in u, then put u back

Problems 1 and 2 worked out · Version 0A

$$\int \cos(2x)\,dx = \frac{\sin(2x)}{2} + C$$

$u = 2x,\ du = 2\,dx$ divide by 2

$$\frac{\sin(2x)}{2} + C$$

$$\int \cos(5x)\,dx = \frac{\sin(5x)}{5} + C$$

$u = 5x,\ du = 5\,dx$ divide by 5

$$\frac{\sin(5x)}{5} + C$$

Substitution · Version 0A

1) $\frac{\sin(2x)}{2} + C$ 2) $\frac{\sin(5x)}{5} + C$ 3) $\frac{\sin(3x)}{3} + C$

4) $\frac{\sin(6x)}{6} + C$ 5) $-\frac{\cos(5x)}{5} + C$ 6) $\frac{e^{6x}}{6} + C$

7) $\frac{(x^2-4)^6}{3} + C$ 8) $\frac{\sin(3x)}{3} + C$ 9) $-\frac{\cos(4x)}{4} + C$

10) $-\frac{\cos(2x)}{2} + C$ 11) $\ln(x^2+5) + C$

12) $\frac{(x^2-1)^4}{4} + C$ 13) $\frac{e^{2x}}{2} + C$ 14) $-\frac{\cos(3x)}{3} + C$

15) $\ln(x^2+7) + C$