

11.2) Integrating $f(ax + b)$

Worked example

Find:

$$\int (6x + 1)^2 dx$$

$$\int (5x - 2)^3 dx$$

$$\int (4x + 3)^4 dx$$

Your turn

Find:

$$\int (3x - 4)^5 dx$$

$$\frac{1}{18} (3x + 4)^6 + c$$

Worked example

Find:

$$\int \frac{1}{2(3x - 4)^4} dx$$

$$\int \frac{1}{4(2 - 3x)^3} dx$$

Your turn

Find:

$$\int \frac{1}{3(4x - 2)^2} dx$$

$$-\frac{1}{12(4x - 2)} + c$$

Worked example

Find:

$$\int (3x - 1)^2$$

$$\int (3x - 1) dx$$

$$\int \frac{1}{3x - 1} dx$$

$$\int \frac{1}{(3x - 1)^2} dx$$

Your turn

Find:

$$\int (2x + 1)^2$$

$$\frac{1}{6}(2x + 1)^3 + c$$

$$\int (2x + 1) dx$$

$$x^2 + x + c$$

$$\int \frac{1}{2x + 1} dx$$

$$\frac{1}{2} \ln |2x + 1| + c$$

$$\int \frac{1}{(2x + 1)^2} dx$$

$$-\frac{1}{2(2x + 1)} + c$$

Worked example

Find:

$$\int \sin(6x + 1) \, dx$$

$$\int -\sin\left(\frac{x}{5} - 2\right) \, dx$$

$$\int \sin(3 - 4x) \, dx$$

Your turn

Find:

$$\int -\sin\left(\frac{1}{3}x - 4\right) \, dx$$

$$3 \cos\left(\frac{1}{3}x - 4\right) + c$$

Worked example

Find:

$$\int \cos(6x + 1) \, dx$$

$$\int -\cos\left(\frac{x}{5} - 2\right) \, dx$$

$$\int \cos(3 - 4x) \, dx$$

Your turn

Find:

$$\int -\cos(4 - 3x) \, dx$$

$$\frac{1}{3} \sin(4 - 3x) + c$$

Worked example

Find:

$$\int \frac{1}{6x - 1} dx$$

$$\int \frac{1}{\frac{1}{5}x + 2} dx$$

$$\int \frac{1}{3 - 4x} dx$$

Your turn

Find:

$$\int \frac{1}{-\frac{1}{3}x + 4} dx$$

$$-3 \ln \left| -\frac{1}{3}x + 4 \right| + c$$

Worked example

Find:

$$\int \sec^2(2x - 3) dx$$

$$\int 6\sec^2(5 - 4x) dx$$

Your turn

Find:

$$\int 3\sec^2(2x + 1) dx$$

$$\frac{3}{2} \tan(2x + 1) + c$$

Worked example

Find:

$$\int \sec 5x \tan 5x \, dx$$

$$\int \sec \frac{x}{4} \tan \frac{x}{4} \, dx$$

Your turn

Find:

$$\int \sec(3x) \tan(3x) \, dx$$

$$\frac{1}{3} \sec(3x) + c$$

Worked example

Find:

$$\int e^{6x+1} dx$$

$$\int e^{\frac{1}{5}x-2} dx$$

$$\int e^{4-3x} dx$$

Your turn

Find:

$$\int e^{-\frac{1}{3}x-4} dx$$

$$-3e^{-\frac{1}{3}x-4} + c$$

Worked example

Find:

$$\int (e^x - 1)^3 dx$$

Your turn

Find:

$$\int (e^x + 1)^2 dx$$

$$\frac{1}{2}e^{2x} + 2e^x + x + C$$