

You need to be able to differentiate the product of two functions.

■ **If  $y = uv$  then  $\frac{dy}{dx} = u\frac{dv}{dx} + v\frac{du}{dx}$ ,**

**where  $u$  and  $v$  are functions of  $x$ .**

The product rule in function notation is:

■ **If  $f(x) = g(x)h(x)$  then  $f'(x) = g(x)h'(x) + h(x)g'(x)$**

Given that  $f(x) = x^2\sqrt{3x-1}$ , find  $f'(x)$ .

Given that  $y = e^{4x} \sin^2 3x$ , show that  $\frac{dy}{dx} = e^{4x} \sin 3x (A \cos 3x + B \sin 3x)$ , where  $A$  and  $B$  are constants to be determined.