

Section 2: The chain rule

Crucial points

1. **Make sure you remember the $\frac{du}{dx}$ part of the chain rule**

Example: Differentiate $y = \sqrt{1+2x}$

✗ **Wrong:** $\frac{dy}{dx} = \frac{1}{2}(1+2x)^{-\frac{1}{2}}$

✓ **Right:** $\frac{dy}{dx} = \frac{1}{2}(1+2x)^{-\frac{1}{2}} \times 2 = (1+2x)^{-\frac{1}{2}}$

2. **Recognise situations when the chain rule should be used**

The chain rule should be used for functions which can be written in the form $y = f(u)$, where u is a function of x . It cannot be used to differentiate functions which are a product of two functions – this requires the product rule which is covered in the next section.