Solving using partial fractions

We have already seen in Pure Year 2 how we can use partial fractions to integrate. We can use this to further expand our repertoire of integration techniques for expressions of the form and

Example

Prove that

When you write as partial fractions, ensure you have the **most general possible non-top heavy fraction**, i.e. the ‘order’ (i.e. maximum power) of the numerator is **one less** than the denominator.

Example

Show that , where and are constants to be found.

If the fraction is top-heavy, you’ll have a quotient. As per Pure Year 2, if the order of numerator and denominator is the same, you’ll need an extra constant term. If the power is 1 greater in the numerator, you’ll need a quotient of , and so on.

Test Your Understanding

(a) Express as partial fractions.

(b) Hence find .

Ex 3D Pg 67-68