

## Section 3: Further integration

### Crucial points

- 1. Look out for integrals which need partial fractions**  
Make sure you recognise integrals which can be put into partial fractions, and make sure you know how to integrate each separate type of fraction.
- 2. Make sure that you apply the standard integrals correctly**  
Remember in particular that the coefficient of  $x^2$  must be 1, and that if it isn't you must take out a factor or use a substitution before carrying out the integration.
- 3. Make sure that you are confident in completing the square so that the standard integrals can be applied**  
Get plenty of practice in this if you are not confident with it!
- 4. Look out for integrals where a trigonometric substitution may be needed**  
For integrals which involve a power or root of  $a^2 - x^2$ , the substitution  $x = a \sin \theta$  may be useful, and for integrals which involve a power or root of  $a^2 + x^2$ , the substitution  $x = a \tan \theta$  may be useful.