

### 3. Algebraic Expansion and Factorisation

#### Expansion laws

$$a(b+c)=ab+ac$$

$$(a+b)(c+d) = ac +ad + bc +bd$$

$$(a+b)(a-b)= a^2 - b^2$$

$$(a+b)^2= a^2 + 2ab + b^2$$

#### Factorizing quadratic function

def:

quadratic function - largest x exponent is 2

#### Factorization of $ax^2 + bx + c$

##### "Splitting" the middle term

Step 1: Find two numbers p and q whose sum is b and whose product is ac

Step 2: Replace bx by px + qx

Step 3: Complete the factorization

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Factoring Quadratics When  $a \neq 1$ . Using The AC Method.

Example 1:

$9x^2 + 6x + 1$

$ax^2 + bx + c$

$\frac{9}{3 \times 3}$   
 $3 + 3 = 6$

$9x^2 + 3x + 3x + 1$

$(3x)(3x+1) \quad (1)(3x+1)$

$(3x+1)(3x+1)$

$9x^2$

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