

## Practicing the use of algebraic identities

### 1 The square of a binomial

We have seen the following identities:

$$(a + b)^2 = a^2 + 2ab + b^2 \quad (1)$$

and

$$(a - b)^2 = a^2 - 2ab + b^2 \quad (2)$$

Sometimes these two identities are written together in the following abbreviated form:

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

1. Expand and simplify each of the following, using the above identity:

(a)  $(x - 4)^2$

(b)  $(x + 3)^2$

(c)  $(2x - 3)^2$

(d)  $(-2 + 3x)^2$

(e)  $(-4x - 1)^2$

(f)  $(xy - 5)^2$

(g)  $(2x + 5y)^2$

$$(h) (3a - 7b)^2$$

$$(i) (x^2 + 3x)^2$$

$$(j) (-5x^3 + 8x^5)^2$$

$$(k) (x^2 - y^3)^2$$

$$(l) (3x^2 - 2y^5)^2$$

$$(m) ((x - 2)^2 + (x + 2)^2)^2$$

## 2 Difference of squares

$$(a + b)(a - b) = a^2 - b^2 \quad (3)$$

1. Expand and simplify each of the following, using the above identity:

(a)  $(x + 3)(x - 3)$

(b)  $(a + 1)(a - 1)$

(c)  $(2x - 10)(2x + 10)$

(d)  $(a^2 + 5)(a^2 - 5)$

(e)  $(-3x + 4y)(3x + 4y)$

(f)  $(9x^4 + 6x^2)(9x^4 - 6x^2)$