

Example 20 **Self Tutor**

Expand and simplify:

a $(x + 5)^2$

b $(x - 4)^2$

a
 $(x + 5)^2$
 $= x^2 + 2 \times x \times 5 + 5^2$
 $= x^2 + 10x + 25$

b
 $(x - 4)^2$
 $= x^2 - 2 \times x \times 4 + 4^2$
 $= x^2 - 8x + 16$

Example 21 **Self Tutor**

Expand and simplify using the perfect square expansion rules:

a $(3x + 2)^2$

b $(1 - 5x)^2$

a
 $(3x + 2)^2$
 $= (3x)^2 + 2 \times 3x \times 2 + 2^2$
 $= 9x^2 + 12x + 4$

b
 $(1 - 5x)^2$
 $= 1^2 - 2 \times 1 \times 5x + (5x)^2$
 $= 1 - 10x + 25x^2$

Example 22 **Self Tutor**Expand and simplify: **a** $(3x^2 - 1)^2$ **b** $4 - (x + 3)^2$

a
 $(3x^2 - 1)^2$
 $= (3x^2)^2 - 2 \times 3x^2 \times 1 + 1^2$
 $= 9x^4 - 6x^2 + 1$

b
 $4 - (x + 3)^2$
 $= 4 - (x^2 + 6x + 9)$
 $= 4 - x^2 - 6x - 9$
 $= -x^2 - 6x - 5$