

$$\xrightarrow{1} (ax+b)^2 = (ax+b)(ax+b)$$

$$\xrightarrow{2} \text{Foil out.} \rightarrow (ax)^2 + 2(ax)(b) + b^2$$

Look these steps carefully.
If you can write an expression as $(ax)^2 + 2(ax)(b) + b^2$, you can factor as a perfect square trinomial.

$$\xrightarrow{1} \text{factor} \rightarrow x^2 + 6x + 9$$

$$\xrightarrow{2} \text{rewrite} \rightarrow (x)^2 + 2 \cdot x \cdot 3 + 3^2$$

$$\xrightarrow{3} \text{factor} \rightarrow (x+3)^2$$

$$\xrightarrow{1} 81y^2 + 180xy + 100x^2$$

$$\xrightarrow{2} \text{rewrite} \rightarrow (9y)^2 + 2(9y \cdot 10x) + (10x)^2$$

$$\xrightarrow{3} \text{factor} \rightarrow (9y+10x)^2$$

$$\xrightarrow{1} \text{factor} \rightarrow 4x^2 + 20x + 25$$

$$\xrightarrow{2} \text{rewrite} \rightarrow (2x)^2 + 2(2x \cdot 5) + 5^2$$

$$\xrightarrow{3} \text{factor} \rightarrow (2x+5)^2$$

$$\xrightarrow{1} 4x^2 - 4x + 1$$

$$\xrightarrow{2} (2x)^2 + 2(2x)(-1) + (-1)^2$$

$$\xrightarrow{\text{factor}} (2x-1)^2$$

$$\xrightarrow{1} x^2 + 2xy + y^2$$

$$\xrightarrow{2} \text{rewrite} \rightarrow (x)^2 + 2(x)(y) + (y)^2$$

$$\xrightarrow{3} (x+y)^2$$

$$\xrightarrow{1} x^2 - 2xy + y^2$$

$$\xrightarrow{2} (x)^2 + 2(x)(-y) + (-y)^2$$

$$\xrightarrow{3} (x-y)^2$$

$$\xrightarrow{1} 4x^2 - 12x + 9$$

$$\xrightarrow{2} (2x)^2 + 2(2x)(-3) + (-3)^2$$

$$\xrightarrow{3} (2x-3)^2$$

$$\xrightarrow{1} a^2b^2 + 6ab + 9$$

$$\xrightarrow{2} (ab)^2 + 2(ab) \cdot 3 + 3^2$$

$$\xrightarrow{3} (ab+3)^2$$

$$\xrightarrow{1} 4a^2b^2 - 20ab + 25$$

$$\xrightarrow{2} (2ab)^2 + 2(2ab)(-5) + (-5)^2$$

$$\xrightarrow{3} (2ab-5)^2$$

Again, notice how this process relies on being able to write something like

$$(\text{expression})^2 + 2(\text{expression})(\text{another expression}) + (\text{another expression})^2$$