



Factoring Perfect Square Trinomials

Video Notes

[Video Link](#)

Factoring Perfect Square Trinomials

What background knowledge will I need?

- How to factor a trinomial

Expand:

$(a + b)^2$

$(a+b)(a+b)$

$a^2 + \underline{ab} + \underline{ba} + b^2$

$a^2 + \underline{2ab} + \underline{b^2}$ ← General form of a perfect square trinomial.

Factor:

$$x^2 + 10x + 25$$

$$(x + 5) \cdot (x + 5)$$

$\swarrow \quad \searrow$
 $+5x$
 $\swarrow \quad \searrow$
 $+5x$

$$(x + 5)^2$$

Factor:

$$4x^2 - 12x + 9$$

$$a^2 + 2ab + b^2$$

$$\sqrt{a^2} = \sqrt{4x^2}$$

$$a = 2x$$

$$\sqrt{b^2} = \sqrt{9}$$

$$b = -3 \rightarrow (-3)^2 = (-3)(-3) = 9$$

$$2 \cdot a \cdot b$$

$$2 \cdot (2x) \cdot (-3)$$

$$= -12x$$

$$(2x - 3) \cdot (2x - 3)$$

$\swarrow \quad \searrow$
 $-6x$
 $\swarrow \quad \searrow$
 $-6x$

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

In summary:

A perfect square trinomial is in the form $a^2 + 2ab + b^2$ and factors to $(a + b)^2$

This will be useful when we complete the square.

$$a^2 + 2ab + b^2 \xrightarrow{\text{factored}} (a + b)^2$$

$$x^2 + 10x + 25 \rightarrow \text{perfect square trinomial}$$

$$-a = (x)$$

$$b = (5)$$

$$a \cdot b = x \cdot 5 = 5x$$

$$2ab = 2(5x) = 10x$$

$$\text{factored: } (a + b)^2 = (x + 5)^2$$

$$\text{Factored: } (a + b)^2$$

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