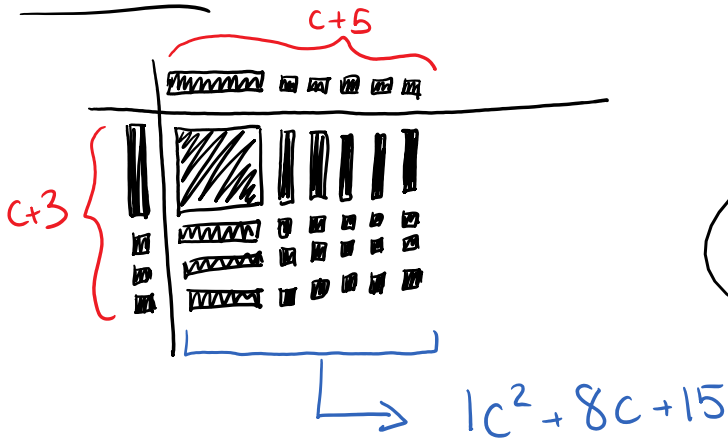


When you multiply 2 binomials of the form $(x+a)(x+b)$ you will get a trinomial:

Ex: Expand $(c+5)(c+3)$



Method 1: Algebra Tiles



$$\therefore (c+5)(c+3) = c^2 + 8c + 15$$

Method 2: Box method

	c	5	
c	$c \cdot c = c^2$	$c \cdot 5 = 5c$	$\Rightarrow c^2 + 5c + 3c + 15$
3	$3 \cdot c = 3c$	$3 \cdot 5 = 15$	

combine
↓
 $= c^2 + 8c + 15$

Method 3: Distributive Property:

$$(c+3)(c+5) = c^2 + 5c + 3c + 15$$

combine
↓
 $= c^2 + 8c + 15$

Ex: Expand $(x-4)(x+2)$

	x	-4	
x	$x \cdot x$ $= x^2$	$x \cdot (-4)$ $= -4x$	$\Rightarrow x^2 - 4x + 2x - 8$ \downarrow combine \downarrow $= x^2 - 2x - 8$
2	$2 \cdot x$ $= 2x$	$2 \cdot (-4)$ $= -8$	

Now we go the other way, factor a trinomial in to 2 binomials.

Ex: Factor $x^2 + 5x + 6$

we know

$$x^2 + 5x + 6 = (x + \square)(x + \square)$$

Find 2 numbers that add to the "x" term, and multiply to the term without a variable (the constant term).

In this case, $\frac{2}{2} + \frac{3}{3} = 5$
 $\frac{2}{2} \times \frac{3}{3} = 6$

So, $x^2 + 5x + 6 = (x+2)(x+3)$

Check by expanding: $(x+2)(x+3) = x^2 + 3x + 2x + 6$
 $= x^2 + 5x + 6$ ✓
correct.

Sometimes, one or both numbers will be negative...

Ex: Factor $n^2 + 2n - 15$

$$\Rightarrow \underline{-3} + \underline{5} = 2 \Rightarrow$$

$$\underline{-3} \times \underline{5} = -15$$

$$n^2 + 2n - 15 = (n-3)(n+5)$$

Ex: Factor $p^2 - 6p + 9$

$$\Rightarrow \underline{-3} + \underline{-3} = -6 \Rightarrow p^2 - 6p + 9 = (p-3)(p-3)$$

$$\underline{-3} \times \underline{-3} = 9 \qquad \qquad \qquad = (p-3)^2$$

Sometimes, the terms will be in a different order, just rearrange it:

Ex: Factor $-24 - 5d + d^2$

$$\hookrightarrow d^2 - 5d - 24$$

$$\left. \begin{array}{l} \underline{3} + \underline{-8} = -5 \\ \underline{3} \times \underline{-8} = -24 \end{array} \right\} \begin{array}{l} d^2 - 5d - 24 \\ = (d+3)(d-8) \end{array}$$

Sometimes the "x²" term will have a coefficient in front of it. When this happens, factor out THAT number from every term, then proceed as normal.

Ex: Factor $-4t^2 - 16t + 20$

Uh-oh!
Coefficient!

Factor -4 : $-4t^2 - 16t + 20$

$$-4(t^2) - 4(4t) - 4(-5)$$

$$= -4(t^2 + 4t - 5)$$

↳ Factor as normal.

Don't Forget!

$$\frac{-1}{-1} + \frac{5}{5} = 4$$

$$\frac{-1}{-1} \times \frac{5}{5} = -5$$

$$\Rightarrow -4(t-1)(t+5)$$

HW: Pg. 166 # 4-7, 9-10, 12, 14, 15, 21

↳ Any method.