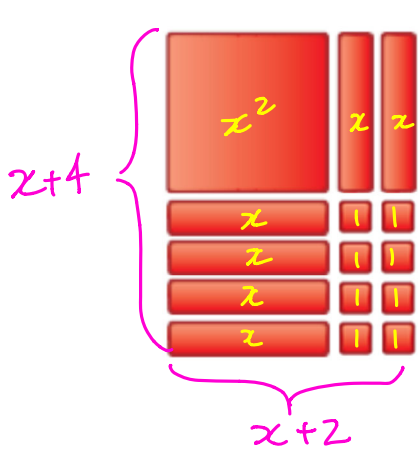


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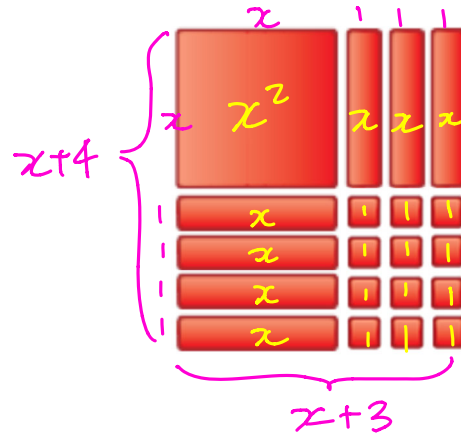
Learning Goal 3.3	Factor trinomials of the form $ax^2 + bx + c$.
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Yesterday we investigated how we can relate an area model to binomial products and trinomial expressions.



Trinomial : $x^2 + 6x + 8$

Binomial Product : $(x+4)(x+2)$



Trinomial : $x^2 + 7x + 12$

Binomial Product : $(x+4)(x+3)$

But again, you cannot use this model forever.

- negative area has no meaning / fiddley
- limited to 2D

Example Factor the following expression. Expand your answer to check your work.

1. $x^2 + 10x + 16$

$\underline{2} \times \underline{8} = 1 \times 16 = 16$ ← always be the product of the coefficient of the x^2 and the constant
 $\underline{2} + \underline{8} = 10$

1	16
2	8
4	4

$= x^2 + 2x + 8x + 16$
 $= x(x+2) + 8(x+2)$ ← check
 $= (x+2)(x+8)$

↑
no variable.

2. $x^2 - 2x - 8 = \underline{x^2 + 2x} - \underline{4x - 8}$

$$\underline{2} \times \underline{-4} = 1 \times -8 = -8 = x(x+2) - 4(x+2)$$

$$\underline{2} + \underline{-4} = -2$$

$$= (x+2)(x-4)$$

$$\begin{array}{cc} 1 & 8 \\ \hline 2 & 4 \end{array}$$

4. $m^2 - 8m + 7$

$$= (m-7)(m-1)$$

3. $z^2 - 12z + 35$

$$\underline{-5} \times \underline{-7} = 1 \times 35 = 35$$

$$\underline{-5} + \underline{-7} = -12$$

$$\begin{array}{cc} 1 & 35 \\ \hline 5 & 7 \end{array} = \underline{z^2 - 5z} - \underline{7z + 35}$$

$$= z(z-5) - 7(z-5)$$

5. $a^2 + 7a - 18 = (z-5)(z-7)$

$$= (a+9)(a-2)$$

6. $q^2 - 7q - 18$

$$(q-9)(q+2)$$

7. $p^2 + 7p - 18$

$$= (p+9)(p-2)$$

Example What are all the possible values of a ? For each value, factor the expression.

$$x^2 + ax + 24$$

$$\underline{-1} \times \underline{-24} = 1 \times 24$$

$$\underline{-1} + \underline{-24} = a$$

$$1 \quad 24 \Rightarrow a = \pm 25$$

$$2 \quad 12 \Rightarrow a = \pm 14$$

$$3 \quad 8 \Rightarrow a = \pm 11$$

$$4 \quad 6 \Rightarrow a = \pm 10$$

;-)