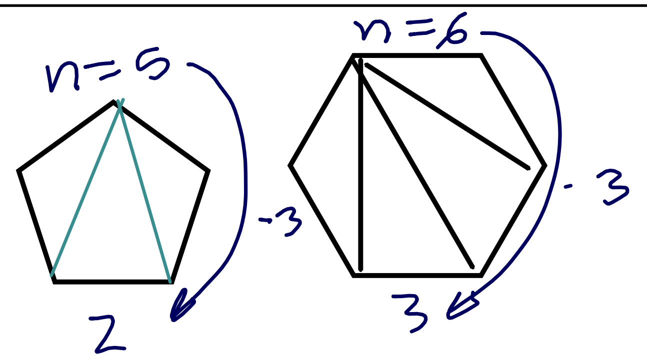
22.

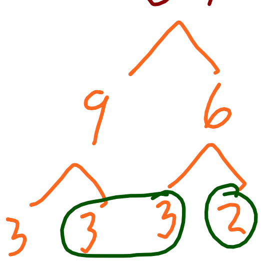


b) $n - 3$

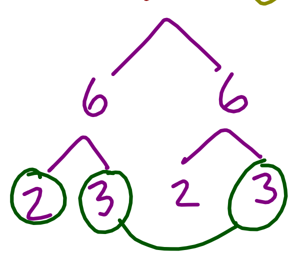
c) $\frac{n^2}{2} - \frac{3n}{2}$

$= \frac{n}{2}(n-3)$

$54 = 2 \cdot 3^3$



$36 = 2^2 \cdot 3^2$



$GCF = 2 \cdot 3 \cdot 3$

$= 18$

$LCM = 2^2 \cdot 3^3$

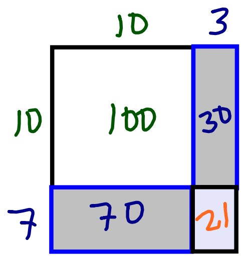
$= 108$

$2 \cdot 3^3 \cdot 11$ $\quad$ $2^2 \cdot 3^3 \cdot 5$

$LCM = \boxed{2^2 \cdot 3^3 \cdot 5 \cdot 11}$

<u>3.4 Modelling Trinomials as Binomial Products</u>

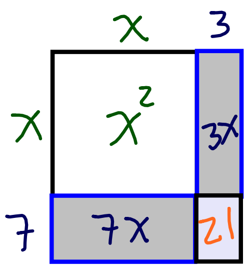
*If we want to multiply 13 x 17 we can use a grid or area model to find the answer



$$\therefore 13 \times 17 = 100 + (30 + 70) + 21$$
$$= 100 + 100 + 21$$
$$= 221$$

*How about if we want to multiply two binomials?

ex. (x + 3)(x + 7)



$$(x+3)(x+7)$$
$$= x^2 + \underbrace{3x + 7x} + 21$$
$$= x^2 + 10x + 21$$

*Expand the following

a) (x + 2)(x + 6)

$$= x^2 + \underbrace{6x + 2x} + 12$$
$$= x^2 + 8x + 12$$

b) (x - 2)(x + 6)

$$= x^2 + \underbrace{6x - 2x} - 12$$
$$= x^2 + 4x - 12$$

c) (x + 2)(x - 6)

$$= x^2 - 4x - 12$$

d) (x - 2)(x - 6)

$$= x^2 - 8x + 12$$

What do we notice?

* they all start with x^2
* the coefficient of the middle term is the <u>sum</u> of the constant terms in the original binomials.
* the constant term is the product of the constant terms in the original binomial

Using this property, could we turn a trinomial into the product of two binomials?

ex. a) $x^2 + 7x + 12$

$= (x+3)(x+4)$

b) $x^2 + 7x + 13$ → since there are no factors of 13 that have a sum of 7 → not factorable.

c) $x^2 + 5x + 6$

$= (x+2)(x+3)$

d) $x^2 + x - 12$

$= (x-3)(x+4)$

e) $x^2 - x - 12$

$= (x+3)(x-4)$

* check by expansion

f) $x^2 - x + 12$

$\underline{\ ?\ } \cdot \underline{\ ?\ } = 12$

$\underline{\ ?\ } + \underline{\quad} = -1$

not factorable

What could go in the missing spot to make the trinomial factorable?

g) $x^2 + ?x + 15$ $? = 8$

$(x \pm 5)(x \pm 3)$ $? = -8$

$(x \pm 1)(x \pm 15)$ $? = 16$ $? = -16$

h) $x^2 + ?x + 12$

factors of $12 = \pm 3 \times \pm 4$

$\pm 2 \times \pm 6$

$\pm 1 \times \pm 12$

$? = \pm 7, \pm 8, \pm 13$

i) $x^2 + 5x + ?$

$\left.\begin{array}{l} \text{add to } 5 = 2 + 3 \\ \quad ? = 6 \\ \text{or } 1 + 4 \Rightarrow ? = 4 \\ \text{or } 6 - 1 \Rightarrow ? = -6 \end{array}\right\}$ lots of options

j) $x^2 - 3x + ?$

Algebra tiles can actually be useful! If we can arrange the tiles of a trinomial into a rectangle, the lengths of the rectangle are the factors of the trinomial. Remember these examples? Try using tiles to help find the answers.

$x^2 + 5x + 6$

$x^2 + ?x + 12$

Homefun: Pg. 158 #1-4