Binomial Products
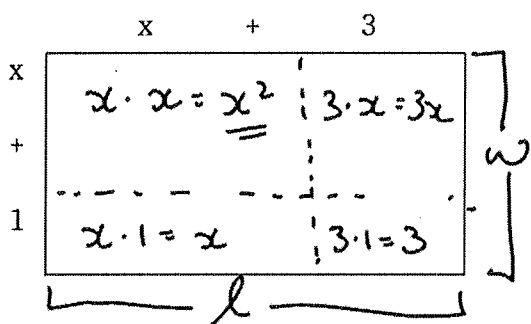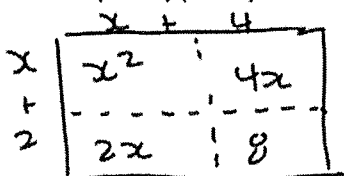
Find an expression for the area of the example below.

$$A = l \cdot w$$
$$= (x+3)(x+1)$$
$$= x^2 + 3x + x + 3$$
$$= x^2 + 4x + 3$$

What about $(x+2)(x+4)$? Find a pattern.

$$A = l \cdot w$$
$$= (x+4)(x+2)$$
$$= x^2 + 4x + 2x + 8.$$
$$= x^2 + 6x + 8$$

*Each term must be multiplied by all the other terms.

Another way to think of this is:

First
Outside
Inside
Last

$(x+4)(x+2)$

$$= (x \cdot x)(2 \cdot x)(4 \cdot x)(4 \cdot 2)$$
$$= x^2 + 2x + 4x + 8$$
$$= x^2 + 6x + 8$$

Shaking Hands

$(x+4)(x+2)$ — seperate 1st binomial

$$= x(x+2) + 4(x+2)$$
$$= x^2 + 2x + 4x + 8$$
$$= x^2 + 6x + 8.$$

— each term must shake hands with the other!

Ex: 1) Expand and simplify:

a) $(x+5)(x+1)$

$$= x^2 + 5x + x + 5$$
$$= x^2 + 6x + 5$$

b) $(x-8)(x+2)$

$$= x^2 - 8x + 2x - 16$$
$$= x^2 - 6x - 16$$

c) $(y-8)(y-3)$

$$= y^2 - 8y - 3y + 24$$
$$= y^2 - 11y + 24$$

d) $(2x+3)(x-2)$

$$= 2x^2 + 3x - 4x - 6$$
$$= 2x^2 - x - 6$$

e) $(3x-4)(2x-5)$

$$= 6x^2 - 15x - 8x + 20$$
$$= 6x^2 - 23x + 20$$

Homework: Worksheet