

Concept B2101) Expanding Binomial Products

The distributive law is used when expanding binomial products.

$$(a+b)(c+d) = a \times (\square + \square) + b \times (\square + \square) = \underline{\hspace{2cm}}$$

Drawing arrows is recommended if the distributive law is found to be difficult.

This allows us to avoid making silly mistakes.

i) $(\overbrace{a+b} \quad \overbrace{c+d}) = ac + ad$ ————— ①

ii) $(\overbrace{a+b} \quad \overbrace{c+d}) = bc + bd$ ————— ②

iii) ① + ② = $ac + ad + bc + bd$

	<i>c</i>	<i>d</i>
<i>a</i>	<i>ac</i>	<i>ad</i>
<i>b</i>	<i>bc</i>	<i>bd</i>

The area of the whole rectangle is $(a+b)(c+d)$

The sum of the small rectangles' area is $ac + ad + bc + bd$.

Therefore, $(a+b)(c+d) = ac + ad + bc + bd$.

Common mistake

$(x+y)^2 = x^2 + y^2$ *Wrong (How do you expand?)*

start different grow smarter

Example

a. Expand and simplify $(x+1)(x+5)$.

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

$$= \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

b. Expand and simplify $-2(x-3)(x+5)$.

$$-2(x-3)(x+5)$$

$$= -2(\underline{\hspace{2cm}})$$

$$= -2(\underline{\hspace{2cm}})$$

$$= \underline{\hspace{2cm}}$$

Try It Yourself!

Expand the following. Your answer must be in descending order.

i) $(3x - 4)(x - 2)$

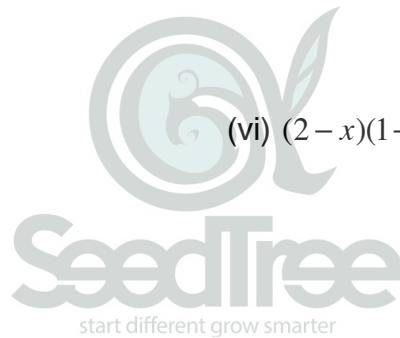
(ii) $(3a + 5)(2a - 3)$

(iii) $(2x + 3)(5x - 10)$

(iv) $(2x - 1)(3x + 1)$

(v) $-3(2x - 3)(2x + 1)$

(vi) $(2 - x)(1 - 3x)$



(vii) $-3(1 - 4x)(3x + 8)$

(viii) $5 - 7(2 - 3x)(4 - x)$

ANSWERS (Try It Yourself!)

i) $3x^2 - 10x + 8$

ii) $6a^2 + a - 15$

iii) $10x^2 - 5x - 30$

iv) $6x^2 - x - 1$

v) $-12x^2 + 12x + 9$

vi) $3x^2 - 7x + 2$

vii) $36x^2 + 87x - 24$

viii) $-21x^2 + 98x - 51$

