

7.1 Multiplying Binomials

A binomial has two terms like $(x + 3)$ or $(6x - 5)$

There are a few ways to multiply binomials.

- 1) Break the first bracket into two terms, then multiply.
- 2) Use the acronym F.O.I.L. as a method to multiply.
- 3) Use algebra tiles

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Expand and simplify.

$$\begin{aligned} & (x + 3)(x + 4) \\ & x(x + 4) + 3(x + 4) \\ & x^2 + 4x + 3x + 16 \\ & \quad \swarrow \searrow \\ & x^2 + 7x + 16 \end{aligned}$$

Brackets together mean to multiply

Split the first bracket, then multiply by the terms in the second bracket.

Group like terms $4x$ and $3x$

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Multiplying Binomials Using FOIL

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

First Outside Inside Last

\uparrow F	\uparrow O	\uparrow I	\uparrow L
$6x^2$	$+ 10x$	$+ 9x$	$+ 15$



Final Step: Combine like terms

$$6x^2 + 10x + 9x + 15$$

$$6x^2 + 19x + 15$$



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Expand and Simplify $(x + 6)(x - 4)$

1) Breaking the first bracket

$$(x + 6)(x - 4)$$

$$x(x - 4) + 6(x - 4)$$

$$x^2 - 4x + 6x - 24$$

$$x^2 + 2x - 24$$

2) Using FOIL

$$(x + 6)(x - 4)$$

F $x \cdot x = x^2$
 O $x \cdot -4 = -4x$
 I $+6 \cdot x = +6x$
 L $+6 \cdot -4 = -24$

$$x^2 - 4x + 6x - 24$$

$$x^2 + 2x - 24$$

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Expand and Simplify - Break First Term (Hammer Time)

$$(3x + 4)(2x + 3)$$

$$3x(2x + 3) + 4(2x + 3)$$

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Expand and Simplify (FOIL)

$$(3x + 4)(2x + 3)$$

F $3x \cdot 2x =$
 O $3x \cdot +3 =$
 I $+4 \cdot 2x =$
 L $+4 \cdot +3 =$

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Try each of the following - Choose a method

$$1 (x + 3)(x + 5) = \underline{\hspace{2cm}}$$

$$2 (x + 2)(x - 4) = \underline{\hspace{2cm}}$$

$$3 (x - 5)(x - 3) = \underline{\hspace{2cm}}$$

$$4 (2x + 4)(x + 7) = \underline{\hspace{2cm}}$$

$$5 (x - 7)(3x - 5) = \underline{\hspace{2cm}}$$

$$6 (3x - 4)(2x + 3) = \underline{\hspace{2cm}}$$

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Textbook Examples

Page 282-286 - Check Example 4 - page 285

$$(x + 2)^2 \text{ means } (x + 2)(x + 2)$$

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Textbook Assignment

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#'s 1a,c,e, 2a,c 3a,c,e ,4a,c

5, 6, 7, 8, 9, 10, 11a,b , 12

14, 15, 16a,b **Handouts**

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$$(x-3)^2 = (x-3)(x-3)$$

$$x^2 - 3x - 3x + 9$$

$$x^2 - 6x + 9$$

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

$$3x^2 + 2x - 5 \quad x=2$$

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

$$3(2 \times 2) + 2(2) - 5$$

$$3(4) + 4 - 5$$

$$12 + 4 - 5$$

$$= 11$$

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

$$- (x+5)(x+5)$$

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11 $(x+5)(4x+10)$

11b) $x=35$

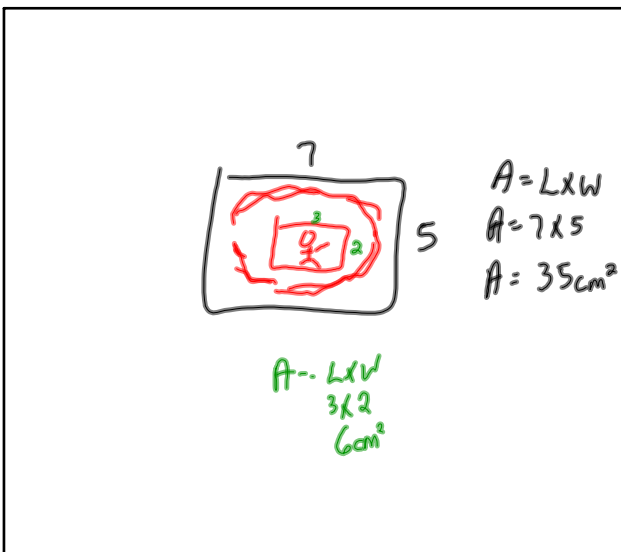
$(35+5)(4(35)+10)$

$A = (40)(140+10)$

$A = x(x+2)$

$A = 7 \times 5$

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$(x-3)^2 \rightarrow (x-3)(x-3)$

$(x-3)^2$
 $\times 2$
 $x^2 - 6x + 9$

$(x+5)^2$
 $x^2 + 10x + 25$

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(H)



$$A = L \times W$$

$$A = (2x + 2.5)(2x + 2.5)$$

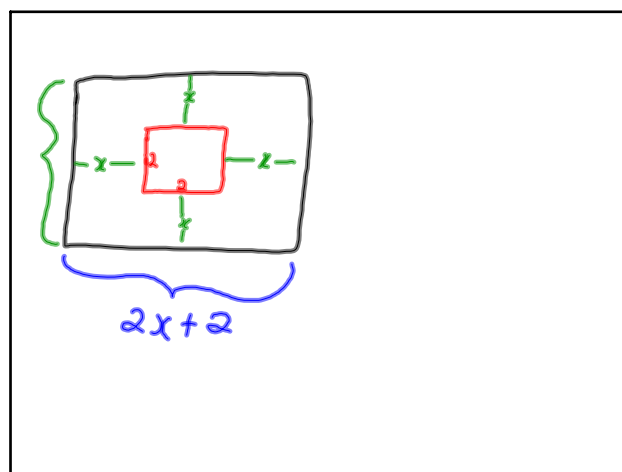
$$A = 4x^2 + 5x + 5x + 6.25$$

$$A = 4x^2 + 10x + 6.25$$

⑤

$(2x + 2.5)$	$(2x + 2.5)$
$2(0.75) + 2.5$	$2(0.75) + 2.5$
$1.50 + 2.5$	$1.50 + 2.5$
4	4

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