

Welcome Back to MYP Math 9!

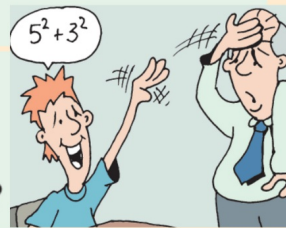
	Assignment Effort Grade (Circle One)	Comments (What was interesting or challenging?)
Monday Date: <u>3/5</u> Topic: _____	0 1 2	No Homework (Test Friday)
Tuesday Date: <u>3/6</u> Topic: _____	0 1 2	
Wednesday Date: <u>3/7</u> Topic: <u>21A Quadratic Functions</u>	0 1 2	
Thursday Date: <u>3/8</u> Topic: <u>Distributive Property</u>	0 1 2	
Friday Date: _____ Topic: _____	0 1 2	

Warm-up: **OPENING PROBLEM**

Anton thinks that to find the square of the sum of two numbers, you can just square each of the numbers, then add the results.

Things to think about:

- a Does $(5 + 3)^2 \neq 5^2 + 3^2$?
- b Can you explain why Anton is incorrect?



$$(5 + 3)^2 = 8^2 = 64$$

$$5^2 + 3^2 = 25 + 9 = 34 \neq 64$$

Warm-up: **OPENING PROBLEM**

$$(3 + 5) 8$$

3	9	15
8 +	15	25
5		

$$= 64$$

Late Start Schedule:

<u>Lunch A</u>			<u>Lunch B</u>			<u>Lunch C</u>		
1st Hour	10:05-10:38	33 minutes	1st Hour	10:05-10:38	33 minutes	1st Hour	10:05-10:38	33 minutes
2nd Hour	10:43-11:16	33 minutes	2nd Hour	10:43-11:16	33 minutes	2nd Hour	10:43-11:16	33 minutes
3rd Hour	11:21-11:54	33 minutes	3rd Hour	11:21-11:54	33 minutes	3rd Hour	11:21-11:54	33 minutes
Lunch A	11:59-12:29	30 minutes	4th Hour	11:59-12:32	33 minutes	4th Hour	11:59-12:32	33 minutes
4th Hour	12:34-1:07	33 minutes	Lunch B	12:37-1:07	30 minutes	5th Hour	12:37-1:12	33 minutes
5th Hour	1:12-1:45	33 minutes	5th Hour	1:12-1:45	33 minutes	Lunch C	1:17-1:45	30 minutes
6th Hour	1:50-2:23	33 minutes	6th Hour	1:50-2:23	33 minutes	6th Hour	1:50-2:23	33 minutes
7th Hour	2:28-3:00	32 minutes	7th Hour	2:28-3:00	32 minutes	7th Hour	2:28-3:00	32 minutes

Class Plan:

1. Warm-up

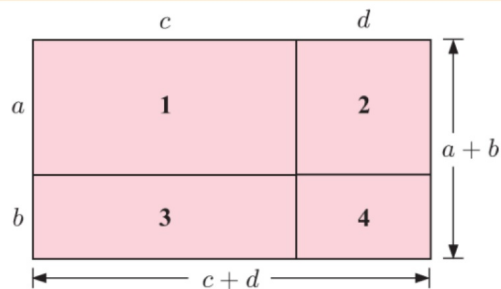
2. 4B The Product Rule

- Examples

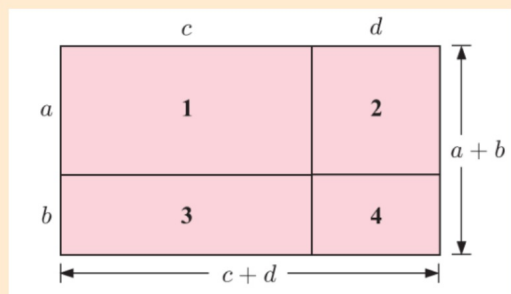
- Joke Break!

$$\begin{aligned}(a + b)(c + d) &= a(c + d) + b(c + d) \\ &= ac + ad + bc + bd\end{aligned}$$

3. Practice



Investigation: Find the areas.



- a** rectangle 1
- b** rectangle 2
- c** rectangle 3
- d** rectangle 4
- e** the overall rectangle.

What can you conclude?

B**THE PRODUCT** $(a + b)(c + d)$

The product $(a + b)(c + d)$ has two **factors**, $(a + b)$ and $(c + d)$.

We can evaluate this product by using the distributive law several times.

The final result contains four terms:

ac is the product of the **First** terms of each bracket.

ad is the product of the **Outer** terms of each bracket.

bc is the product of the **Inner** terms of each bracket.

bd is the product of the **Last** terms of each bracket.

$$\begin{aligned}(a + b)(c + d) &= a(c + d) + b(c + d) \\ &= ac + ad + bc + bd\end{aligned}$$

This is sometimes called the **FOIL** rule.

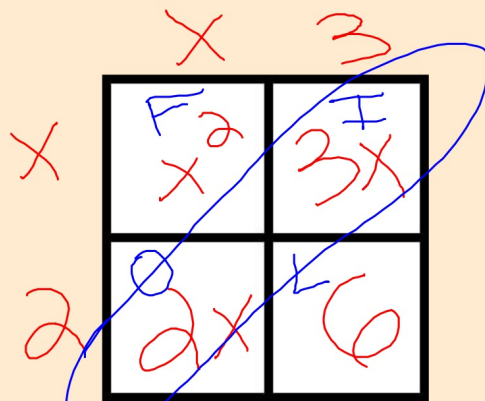


Example 3

Expand and simplify:

a $(x + 3)(x + 2)$

F: $x \cdot x = x^2$
O: $x \cdot 2 = 2x$
I: $3 \cdot x = 3x$
L: $3 \cdot 2 = 6$



$x^2 + 5x + 6$

Example 3

Expand and simplify:

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

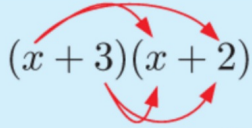
F:
O:
I:
L:

	$2x$	1
$3x$	$6x^2$	$3x$
-2	$-4x$	-2

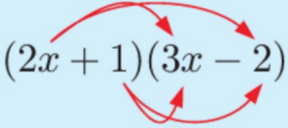
$6x^2 - x - 2$

Solutions

a $(x + 3)(x + 2)$


$$\begin{aligned} &= x \times x + x \times 2 + 3 \times x + 3 \times 2 \\ &= x^2 + 2x + 3x + 6 \\ &= x^2 + 5x + 6 \end{aligned}$$

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


$$\begin{aligned} &= 2x \times 3x + 2x \times -2 + 1 \times 3x + 1 \times -2 \\ &= 6x^2 - 4x + 3x - 2 \\ &= 6x^2 - x - 2 \end{aligned}$$

Example 4

Expand and simplify:

a $(x + 3)(x - 3)$

$$= x^2 - 9$$

$$x^2 + 3x - 3x - 9 = 0$$

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

Joke Break!

PLAN

$(P+L)(A+N)$

$PA+PN+LA+LN$

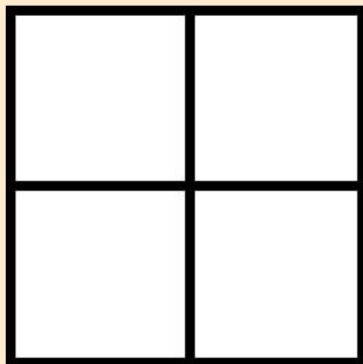
Your plan has been
foiled



Example 4

Expand and simplify:

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



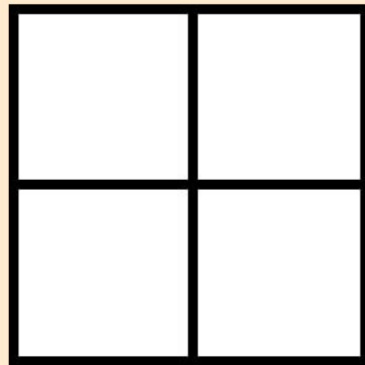
What do you notice about the two middle terms?



Example 5

Expand and simplify:

a $(3x + 1)^2$



Solutions

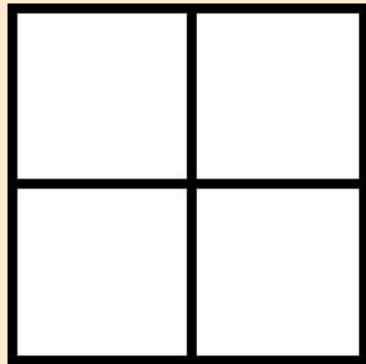
$$\begin{aligned}\mathbf{a} \quad & (x + 3)(x - 3) \\ & = x^2 - 3x + 3x - 9 \\ & = x^2 - 9\end{aligned}$$

$$\begin{aligned}\mathbf{b} \quad & (3x - 5)(3x + 5) \\ & = 9x^2 + 15x - 15x - 25 \\ & = 9x^2 - 25\end{aligned}$$

Example 5

Expand and simplify:

b $(2x - 3)^2$



What do you notice about the two middle terms?



Solutions

$$\begin{aligned}\mathbf{b} \quad & (2x - 3)^2 \\ &= (2x - 3)(2x - 3) \\ &= 4x^2 - 6x - 6x + 9 \\ &= 4x^2 - 12x + 9\end{aligned}$$

$$\begin{aligned}\mathbf{a} \quad & (3x + 1)^2 \\ &= (3x + 1)(3x + 1) \\ &= 9x^2 + 3x + 3x + 1 \\ &= 9x^2 + 6x + 1\end{aligned}$$

Example 6

Expand and simplify:

$$(x + 2)(x - 3) + 5(x + 4) = x^2 + 4x + 14$$

	x	2
x	x^2	$2x$
-3	$-3x$	-6

$$+$$

	x	4
5	$5x$	20



Example 6

Expand and simplify:

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

Solution

$$\begin{aligned} & (x + 2)(x - 3) + 5(x + 4) \\ &= x^2 - 3x + 2x - 6 + 5x + 20 \\ &= x^2 + 4x + 14 \end{aligned}$$

Exercises...

2 Use the rule $(a + b)(c + d) = ac + ad + bc + bd$ to expand and simplify:

a $(x + 2)(x + 5)$

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

c $(x - 3)(x + 7)$

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

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

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

Exercises...

2 Use the rule $(a + b)(c + d) = ac + ad + bc + bd$ to expand and simplify:

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

h $(6 - x)(2x + 5)$

i $(4x - 3)(1 + x)$

j $(4 - x)(4 + 5x)$

k $(8 - x)(2x + 5)$

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

Exercises...

3 Expand and simplify:

$$(x-a)(x+a) = x^2 - a^2$$
$$x^2 - ax + ax - a^2$$

a $(x+2)(x-2)$

b $(a+4)(a-4)$

c $(6+x)(6-x)$

d $(3x+1)(3x-1)$

e $(5a+2)(5a-2)$

f $(7a-3)(7a+$

Exercises...

4 Expand and simplify:

a $(x + 3)^2$

b $(x - 4)^2$

c $(1 - x)^2$

d $(2 + x)^2$

e $(2x + 1)^2$

f $(2 - 3x)^2$

g $(3 + 5x)^2$

h $(2x -$

Exercises...

5 Expand and simplify:

a $(x + 5)(x + 1) + 2(x - 2)$

b $4(x + 2) + (x - 3)(x + 6)$

c $(2a + 5)(a - 6) + a(a + 7)$

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

e $(2x + 3)(x + 2) + (x + 6)(x - 5)$

f $(y + 7)(y - 4) - (y + 1)(y + 3)$

g $(k + 2)(k - 5) - (2k + 1)(k - 3)$

h $(x + 2)(x - 2) + (x + 6)(x - 6)$

Exercises...Answers

EXERCISE 4B

- 1** a ac b ad c bc d bd
e $ac + ad + bc + bd$ or $(a + b)(c + d)$
 $\therefore (a + b)(c + d) = ac + ad + bc + bd$
- 2** a $x^2 + 7x + 10$ b $x^2 - 2x - 24$ c $x^2 + 4x - 21$
d $x^2 - 25$ e $x^2 - 6x - 16$ f $12x^2 + 11x + 2$
g $-6x^2 - x + 1$ h $-2x^2 + 7x + 30$
i $12x^2 - 5x - 3$ j $-5x^2 + 16x + 16$
k $-2x^2 + 11x + 40$ l $9x^2 + 12x + 4$
- 3** a $x^2 - 4$ b $a^2 - 16$ c $36 - x^2$
d $9x^2 - 1$ e $25a^2 - 4$ f $49a^2 - 9$
- 4** a $x^2 + 6x + 9$ b $x^2 - 8x + 16$ c $1 - 2x + x^2$
d $4 + 4x + x^2$ e $4x^2 + 4x + 1$ f $4 - 12x + 9x^2$
g $9 + 30x + 25x^2$ h $4x^2 - 4xy + y^2$
- 5** a $x^2 + 8x + 1$ b $x^2 + 7x - 10$ c $3a^2 - 30$
d $5x^2 - 2x - 15$ e $3x^2 + 8x - 24$ f $-y - 31$
g $-k^2 + 2k - 7$ h $2x^2 - 40$