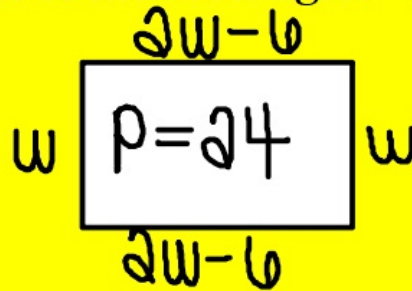


Warm Up

April 10, 2019

1.) A rectangle has a perimeter of 24 units. The length of the rectangle is 2 times 3 less than the width. What is the width of the rectangle?

$W = w$
 $L = 2w - 3$



$2(w - 3)$
 $2w - 3$
 $6w - 12 = 24$
 $+12 +12$

 $6w = 36$
 $\frac{6w}{6} = \frac{36}{6}$

$w = 6$ units

2.) Every ten years, the Census counts how many people are living in every town in the United States.

- The 2010 Census showed that 1,000 people were living in Appleville, and 4,000 were living in Bridgetown.
- The population in Appleville is predicted to double every ten years.
- The population of Bridgetown is predicted to increase by 1,000 every ten years.

If the predictions come true, what will be the first census year that will show Appleville with a larger population than Bridgetown?

decades since		Appvll.	Btown
2010	0	1000	4000
	1	2000	5000
	2	4000	6000
	3	8000	7000

2040

What We Know So Far:

Adding and Subtracting Polynomials =

Multiplying Monomials and Polynomials =

Multiplying Binomials

Steps for the box method

1. Find the area of each small box.
2. Find the area of the large box by combining the areas of all four small boxes.

A. EXAMPLE: Use the box method to find the product of $(x+1)(x+2)$ by finding the area of each individual box and then adding them together. Each binomial has two terms. The side lengths of the small boxes will be represented by the terms from each binomial.

	x	+	1
x	x^2	x	
+	x	2	
2	$2x$	2	

1. determine the area of each box

2. Combine all four small boxes together by addition to find the total area of the large box
_____ = $(x+1)(x+2)$

$$x^2 + 3x + 2$$

B. As you work through the problems below, think about what is happening mathematically with the two binomials. How is the area of each small box determined? Try to recognize patterns or repeated procedures and attempt to derive a procedure to multiply the binomials that does not require the use of boxes.

Directions: Use the box method to find the product of the binomials.

1. $(x+3)(x+5)$

	x	$+ 5$
x	x^2	$5x$
$+ 3$	$3x$	15

Answer = $x^2 + 8x + 15$

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

	x	$- 3$
x	x^2	$-3x$
$+ 4$	$4x$	-12

Answer = $x^2 + x - 12$

3. $(x+1)(x-7)$

	x	$+ 1$
x	x^2	x
$- 7$	$-7x$	-7

Answer = $x^2 - 6x - 7$

4. $(x-2)(2x-6)$

	$2x$	$- 6$
x	$2x^2$	$-6x$
$- 2$	$-4x$	12

Answer = $2x^2 - 10x + 12$

C. Looking back at your work from part B, the box method, think about any patterns or repeated procedures that you did. For example, How did you find the area of just one box?

Describe a procedure that **does not** require the use of boxes to find the product of the two binomials below.

To multiply $(x+4)(x+6)$

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

FOIL diagram: F (red arc), O (orange arc), I (purple arc), L (blue arc)

$$x^2 + 6x + 4x + 24$$
$$x^2 + 10x + 24$$

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

) add

FOIL Method (First, Outer, Inner, Last)

D. Apply the method you described in part C to find the products below. DO NOT use the box method.

<p>a. $(x+6)(x+7)$</p> <p>$(x+6)(x+7)$</p> <p>$x^2 + 7x + 6x + 42$</p> <p>$x^2 + 13x + 42$</p>	<p>b. $(x+2)(x-5)$</p> <p>$(x+2)(x-5)$</p> <p>$x^2 - 5x + 2x - 10$</p> <p>$x^2 - 3x - 10$</p>	<p>c. $(3x+1)(x-3)$</p> <p>$(3x+1)(x-3)$</p> <p>$3x^2 - 9x + x - 3$</p> <p>$3x^2 - 8x - 3$</p>
--------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------

Binomial x Trinomial

*You cannot FOIL - only distribute or box method.

1. $(x + 4)(x^2 + 3x - 6)$

	x^2	$+ 3x$	$- 6$
x	x^3	$3x^2$	$- 6x$
$+ 4$	$4x^2$	$12x$	$- 24$

$x^3 + 7x^2 + 6x - 24$

2. $(y + 1)(y^2 + 2y + 4)$

$y^3 + 2y^2 + 4y + y^2 + 2y + 4$

$y^3 + 3y^2 + 6y + 4$

3. $(k - 5)(k^2 - k - 8)$

	k^2	$- k$	$- 8$
k	k^3	$- k^2$	$- 8k$
$- 5$	$- 5k^2$	$5k$	40

$k^3 - 6k^2 - 3k + 40$

4. $(m + 3)(m^2 + 3m + 5)$