Warm Up November 9, 2018

1.) The sequence below shows the total number of days Francisco had used his gym membership at the end of weeks 1, 2, 3, and 4.

4, 9, 14, 19

Assuming the pattern continued, which function could be used to find the total number of days Fransisco had used his gym membership at the end of week, *n?*

$d = 5$

$a_1 = 4$

$a_n = d(n-1) + a_1$

~~A. f(n) = n + 5~~

B. f(n) = 5n - 1

C. f(n) = 5n + 4

~~D. f(n) = n^2~~

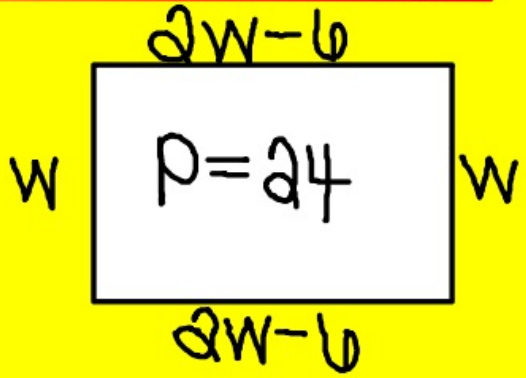
$a_n = 5(n-1) + 4$

$5n - 5 + 4$

$a_n = 5n - 1$

2.) 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?

$2 \cdot (w - 3)$



$6w - 12 = 24$

$+12 \quad +12$

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

$w = 6$ units

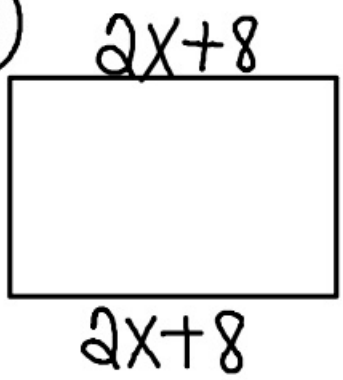
#9

$2\pi r$

$2\pi(x+3)$

$2\pi x + 6\pi$

#10



$P = 8x+10$

$8x+10-(4x+16) = \frac{4x-6}{2}$

$2x-3$

What We Know So Far:

Adding and Subtracting Polynomials =

combine like terms

Multiplying Monomials and Polynomials =

multiply coefficients add exponents

Multiplying Binomials

Steps for the box method

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

A. EXAMPLE: Use the box method to find the product of (x+4)(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	+ 4
x	x^2	4x
+ 2	2x	8

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+2)(x+4)

$x^2+4x+2x+8$

x^2+6x+8

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	-7
x	x^2	$-7x$
$+1$	$+x$	-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) $(x+4)(x+6)$

F : $x \cdot x = x^2$ first

O : $x \cdot 6 = 6x$ outer

I : $4 \cdot x = 4x$ inner

L : $4 \cdot 6 = 24$ last

$x^2 + 10x + 24$

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.

a. $(x+6)(x+7)$

$(x+6)(x+7)$

F O I L

$x^2+7x+6x+42$

b. $(x+2)(x-5)$

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

F O I L

$x^2-5x+2x-10$

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

F → $3x \cdot x = 3x^2$

O → $3x \cdot -3 = -9x$

I → $1 \cdot x = x$

L → $1 \cdot -3 = -3$

$x^2+13x+42$

$(x+4)^2$

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

$x^2+4x+4x+16$

$x^2+8x+16$

$x^2-3x-10$

$(1+5)^2$

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

$6 \cdot 6$

36

$\cancel{1^2+5^2=26}$

$3x^2-8x-3$

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

$y^2 + 2y + 4$

y	y^3	$2y^2$	$4y$
$+1$	y^2	$2y$	4

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

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

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