NOVEMBER, 2017

UNIT 4: POLYNOMIALS

SECTION 5.4: SUBTRACTING POLYNOMIALS

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MATH 9

WHAT'S THE POINT OF TODAY'S LESSON?

We will begin working on the Math 9 Specific Curriculum Outcome (SCO) "Patterns and Relations 6" OR PR6 which states:

PR6: "Model, record and explain the operations of addition and subtraction of polynomial expressions concretely, pictorially and symbolically (limited to polynomials of degree less than or equal to 2)."

What does THAT mean???

SCO PR6 means that we will learn how to add and subtract polynomials [numbers both with and without variables (letters)] first with pictures (algebra tiles) then without.

HOMEWORK QUESTIONS???

Page 228: #3
Page 229 : #8, 9, 10a
Page 230 : #12, 14, 16a, 17, 18a

What's the rule for subtracting integers?

To subtract an integer, ADD its OPPOSITE.

ex: $(+5) - (-2)$

$= (+5) + (+2)$

$= 5 + 2$

$= 7$

What do you suppose the rule is for subtracting a polynomial from another?

That's right - add its opposite!!!

To SUBTRACT polynomials, add the opposite of the second polynomial (the opposite of EVERY term in the second polynomial). At this point, you simply remove the brackets separating the two polynomials and group any like terms (by adding their numerical coefficients) as well as any constants. Also, simplify the signs in "the middle".

Remember:

$+ + = +$

$- - = +$

$+ - = -$

$- + = -$

SUBTRACTING POLYNOMIALS:

Ex.: $(3x^2 + x + 12) - (x^2 + 5x + 2)$

$= (3x^2 + x + 12) + (-x^2 - 5x - 2)$

$= 3x^2 + x + 12 - x^2 - 5x - 2$

$= 3x^2 - x^2 + x - 5x + 12 - 2$

$= 2x^2 - 4x + 10$

There are 2 ways to verify your answers:

1. **Add the answer to the 2nd polynomial in the question; their sum should equal the 1st polynomial in the question:**

$$(2x^2 - 4x + 10) + (x^2 + 5x + 2)$$
$$= 3x^2 + x + 12$$

There are 2 ways to verify your answers:

2. **Verify by substitution. Set the answer equal to the original question, and substitute a value in for the variable (ex: $x = 0$):**

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$$\begin{aligned} 2x^2 - 4x + 10 &= (3x^2 + x + 12) - (x^2 + 5x + 2) \\ 2(0)^2 - 4(0) + 10 &= [3(0)^2 + 0 + 12] - [(0)^2 + 5(0) + 2] \\ 2(0) - 0 + 10 &= (0 + 0 + 12) - (0 + 0 + 2) \\ 0 - 0 + 10 &= 12 - 2 \\ 10 &= 10 \end{aligned}$$

Ex.: $(-5y^2 + 2y) - (-3y^2 + 7y - 2)$

$= -5y^2 + 2y + 3y^2 - 7y + 2$

$= -5y^2 + 3y^2 + 2y - 7y + 2$

$= -2y^2 - 5y + 2$

One more example...

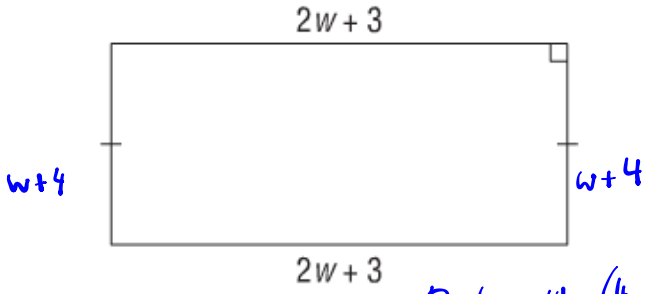
Simplify: $(x^2 + xy + 3y - 2) - (2xy - 4y)$

$= x^2 + xy + 3y - 2 - 2xy + 4y$

$= x^2 + xy - 2xy + 3y + 4y - 2$

$= x^2 - xy + 7y - 2$

The perimeter of the rectangle below is $6w + 14$. Determine the lengths of the unknown sides:



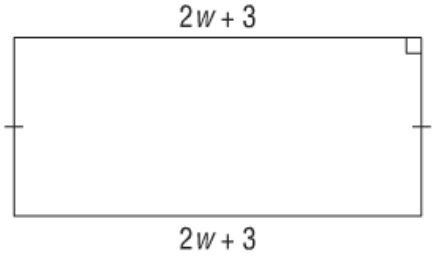
$P = 6w + 14 - (4w + 6)$

$= 6w + 14 - 4w - 6$

$= 2w + 8$

$\text{length} = \frac{2w+8}{2}$

$= w + 4$



$(6w + 14) - [(2w + 3) + (2w + 3)]$

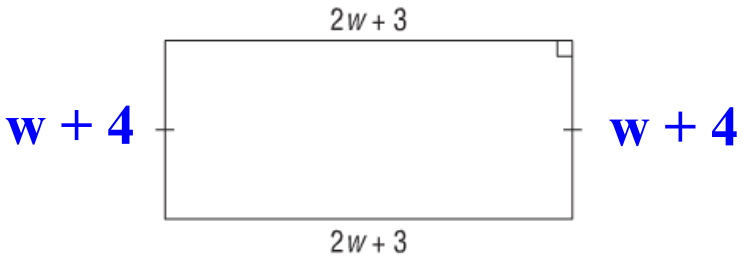
$= (6w + 14) - (4w + 6)$

$= (6w + 14) + (-4w - 6)$

$= 6w + 14 - 4w - 6$

$= 2w + 8$

$w \quad w\,4 \quad 4$



Perimeter = 6w + 14

CONCEPT REINFORCEMENT:
(no need to draw algebra tiles; just do the work)

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Page 235 : 8 - 10, 12, 13
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