NOVEMBER , 2017

UNIT 4: POLYNOMIALS

SECTION 5.2: LIKE TERMS AND UNLIKE TERMS

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MATH 9

WHAT'S THE POINT OF TODAY'S LESSON?

We will continue working on the Math 9 Specific Curriculum Outcome (SCO) "Patterns and Relations 5" OR PR5 which states:

PR5: "Demonstrate an understanding of polynomials (limited to polynomials of degree less than or equal to 2)."

What does THAT mean???

Polynomials, or "pre-algebra", prepare us for solving equations ("algebra").

SCO PR5 means that we will learn about the different parts of polynomials which are a combination of numbers, variables (letters) and mathematical operations (+ / - / x). We will use "algebra tiles" (little plastic rectangles and squares) to help us understand polynomials.

HOMEWORK QUESTIONS?

(Pages 214 / 215 / 216, #8, 11, 12, 13, 15, 16 & 20)

When you work with integers,
a 1-tile and a −1-tile form a zero pair.  0

What do you think happens when you combine algebra tiles with opposite signs?
Which expression do these tiles represent?

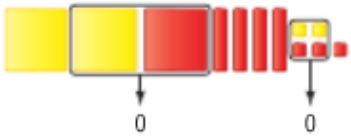
(follow along on pg. 218)

Here is a collection of red and yellow algebra tiles:

We organize the tiles by grouping like tiles:

These tiles represent the polynomial: $2x^2 - x^2 - 4x + 2 - 3$

We simplify the tile model by removing zero pairs.



The remaining tiles represent the polynomial: $x^2 - 4x - 1$

Terms that can be represented by algebra tiles with the same size and shape are called LIKE TERMS.

$-x^2$ and $3x^2$ are like terms.
Each term is modelled with x^2-tiles.
Each term has the same variable, x,
raised to the same exponent, 2.

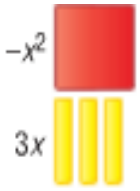
We simplify a polynomial symbolically (with letters and numbers) by adding the numerical coefficients of like terms. This is called *combining like terms*. They have the same variable raised to the same exponent.

ex: $-x^2 + 3x^2$

$= -1x^2 + 3x^2$ **(add the num. coeffs. of -1 and 3)**

$= 2x^2$

$-x^2$ and $3x$ are *unlike terms*.
Each term is modelled with a different algebra tile.
Each term has the variable x,
but the exponents are different.



$-x^2 + 3x$ CANNOT be simplified. We cannot add numerical coefficients when we have unlike terms. ($-x^2 + 3x$ have different exponents.)

EXAMPLE 1 - PAGE 219:

Simplify: $4n^2 - 1 - 3n - 3 + 5n - 2n^2$

$4n^2 - 2n^2 - 3n + 5n - 1 - 3$

$2n^2 + 2n - 4$

EXAMPLE 2 - PAGE 220:

Simplify: $14x^2 - 11 + 30x + 3 + 15x - 25x^2$

$14x^2 - 25x^2 + 30x + 15x - 11 + 3$

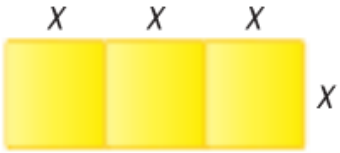
$-11x^2 + 45x - 8$

EXAMPLE 3 - PAGE 220/221:

Write a polynomial to represent the perimeter of each rectangle.

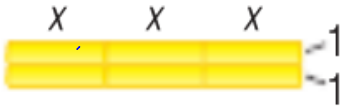
Remember: P (rectangle) = s + s + s + s OR
= 2l + 2w

a)



$P = x + x + x + x + x + x + x + x$
$= 8x$

b)



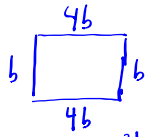
$P = x + x + x + 1 + 1 + x + x + x + 1 + 1$
$= 6x + 4$

EXAMPLE 3 - PAGE 220/221 (cntd.):

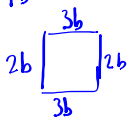
Each polynomial represents the perimeter of a rectangle. Use algebra tiles to make the rectangle.

a) **4a + 2**

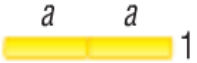
b) **10b**

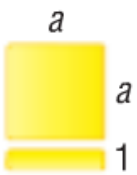


Work backward...

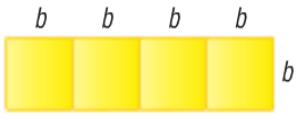


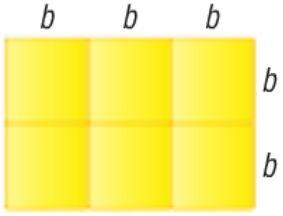
4a + 2
= 2a + 2a + 1 + 1





10b
= 4b + 4b + b + b
OR
= 3b + 3b + 2b + 2b





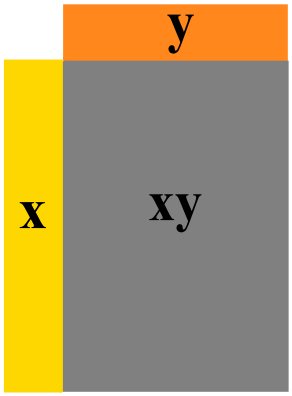
EXAMPLE 4 - PAGE 221:

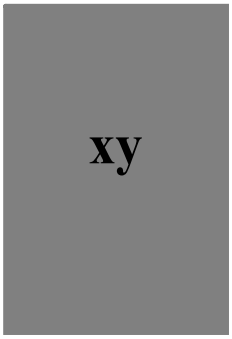
A polynomial may contain more than one variable. Here is a polynomial containing two variables - "x" and "y"; simplify the polynomial:

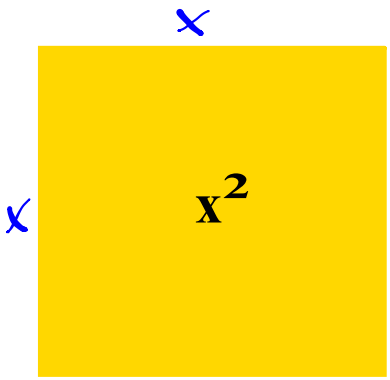
$4xy - y^2 - 3x^2 + 2xy - x - 3y^2$

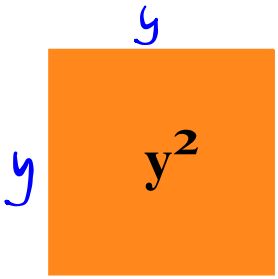
$-3x^2 - x + 4xy + 2xy - y^2 - 3y^2$

$-3x^2 - x + 6xy - 4y^2$


y
x
xy


xy


x
x
x²


y
y
y²

CONCEPT REINFORCEMENT:

MMS9

Page 222: #6 TO #10
Page 223: #12 TO #15 and #19
Page 224: #20 and #22