MYP Algebra I - Level 4
Warm Up

Name ________________________
Date ________________

Exercise 1:

a) How many quarters, nickels, and pennies are needed to make $1.13?

b)

Fill in the blanks:

$$8{,}943 = \_\_\_\_\_ \times 1000 + \_\_\_\_\_ \times 100 + \_\_\_\_\_ \times 10 + \_\_\_\_\_ \times 1$$

$$= \_\_\_\_\_ \times 10^3 + \_\_\_\_\_ \times 10^2 + \_\_\_\_\_ \times 10 + \_\_\_\_\_ \times 1$$

c)

Fill in the blanks:

$$8{,}943 = \_\_\_\_\_ \times 20^3 + \_\_\_\_\_ \times 20^2 + \_\_\_\_\_ \times 20 + \_\_\_\_\_ \times 1$$

Lesson:

Exercise 2:

Now let's be as general as possible by not identifying which base we are in. Just call the base x.

Consider the expression: $1 \times x^3 + 2 \times x^2 + 7 \times x + 3 \times 1$, or equivalently: $x^3 + 2x^2 + 7x + 3$.

a. What is the value of this expression if $x = 10$?

b. What is the value of this expression if $x = 20$

Exercise 3:

a. When writing numbers in base 10, we only allow coefficients of 0 through 9. Why is that?

b. What is the value of $22x + 3$ when $x = 5$? How much money is 22 nickels and 3 pennies?

c. What number is represented by $4x^2 + 17x + 2$ if $x = 10$?

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Module 1 Lesson 8: Adding and Subtracting Polynomials

Exercise 4:

a. 417 + 231 = _____ hundreds + _____ tens + _____ ones + _____ hundreds + _____ tens + _____ ones

= _____ hundreds + _____ tens + _____ ones.

b. $(4x^2 + x + 7) + (2x^2 + 3x + 1)$.

c. $(3x^3 - x^2 + 8) - (x^3 + 5x^2 + 4x - 7)$.

d. $(3x^3 + 8x) - 2(x^3 + 12)$.

e. $(5 - t - t^2) + (9t + t^2)$

f. $(3p + 1) + 6(p - 8) - (p + 2)$

Closing:

How are polynomials like integers?

If you add two polynomials together, is the result sure to be another polynomial? The difference of two polynomials?

Can you think of an example where adding or subtracting two polynomials does not result in a polynomial?

Exit Ticket:

1. Is the sum of three polynomials always another polynomial?

2. Find $(w^2 - w + 1) + (w^3 - 2w^2 + 99)$.

Classwork/Homework

1. Celina says that each of the following expressions is actually a binomial in disguise:

   i. $5abc - 2a^2 + 6abc$
   ii. $5x^3 \cdot 2x^2 - 10x^4 + 3x^5 + 3x \cdot (-2)x^4$
   iii. $(t+2)^2 - 4t$
   iv. $5(a-1) - 10(a-1) + 100(a-1)$
   v. $(2\pi r - \pi r^2)r - (2\pi r - \pi r^2) \cdot 2r$

   For example, she sees that the expression in (i) is algebraically equivalent to $11abc - 2a^2$, which is indeed a binomial. (She is happy to write this as $11abc + (-2)a^2$, if you prefer.)

   Is she right about the remaining four expressions?

2. Find each sum or difference by combining the parts that are alike.

   a. $(2p+4) + 5(p-1) - (p+7)$

   b. $(7x^4 + 9x) - 2(x^4 + 13)$

   c. $(6 - t - t^4) + (9t + t^4)$

   d. $(5 - t^2) + 6(t^2 - 8) - (t^2 + 12)$

e. $(8x^3 + 5x) - 3(x^3 + 2)$

f. $(12x + 1) + 2(x - 4) - (x - 15)$\

g. $(13x^2 + 5x) = 2(x^2 + 1)$

h. $(9 - t - t^2) - \frac{3}{2}(8t + 2t^2)$

i. (4m+6)-12(m-3) +(m+2)

j. $(15x^4 + 10x) - 12(x^4 + 4x)$