## 7.1 Combining Polynomials Day 1

**Obj:** I will understand how to add polynomials.

**HW:** Day 1 Homework BOTH sides.

### Day 1 Notes

<table>
<thead>
<tr>
<th>Vocabulary Word</th>
<th>What does it mean</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monomial</td>
<td>one term</td>
<td>$2x^3 - 5m$</td>
</tr>
<tr>
<td>Binomial</td>
<td>two terms</td>
<td>$2x + 5$</td>
</tr>
<tr>
<td>Trinomial</td>
<td>three terms</td>
<td>$4x^3 + 6x^2 - x$</td>
</tr>
<tr>
<td>Polynomial</td>
<td>the sum of monomials, separated by + or -</td>
<td>$8b$</td>
</tr>
<tr>
<td>Degree of Polynomial</td>
<td>greatest degree of its terms</td>
<td>$4x^2y^8 + 8x^2y^5 - x$ degree: 10</td>
</tr>
<tr>
<td>Standard Form of Polynomial</td>
<td>degree of terms decrease from left to right</td>
<td>$7m^3 + 2m^2 - m$</td>
</tr>
<tr>
<td>Leading Coefficient of Polynomial</td>
<td>the coefficient of 1st terms when written in standard form</td>
<td>$7m^3 + 2m^2 - m$ L.C.: $7$</td>
</tr>
</tbody>
</table>
Classify the following polynomials by the number of terms.

a. $7x^4 + 5$  
   **binomial**

b. $5y^7$  
   **monomial**

c. $5x^2 - 4x - 13$  
   **trinomial**

Identify the degree of each polynomial.

a. $8q^5$  
   **degree 5**

b. $7a^2 + 3$  
   **degree 2**

c. $12c^3 - 3c^2 + c^0$  
   **degree 3**

d. $4a^3b^5$  
   **degree 8**

e. $8a^3b^4$  
   **degree 7**

f. $a^4b^6c^1$  
   **degree 11**

Write each polynomial in standard form and then identify the leading coefficient.

a. $7x - 3x^3 + 4$  
   L.C. **-3**

b. $2.8x + x^7$  
   L.C. **-1**

c. $12 - 6y$  
   L.C. **-6**

d. $4a^3b^2 + a^5b^7$  
   $a^5b^7 + 4a^3b^2$  
   L.C. **1**

Find the sum of each fruit.

$$(3f^2 + f + 4) + (2f^2 + 3f + 2)$$

$= 5f^2 + 4f + 6$
Money is sorted in cash registers. Why?

**Example 1**

Writing Expressions Modeled by Algebra Tiles

Write the algebraic expression modeled by the algebra tiles.

a. $x^2$

b. $3x + 4$

c. $x^3 - x + 2$

**Monitoring Progress**

Write the algebraic expression modeled by the algebra tiles.

1. 

2. 

3. 

4. 

5. 

6. 

7. 

8. 

9.
Fill in your handout.

Classifying Polynomials

Core Concept

Polynomials

A polynomial is a monomial or a sum of monomials. Each monomial is called a term of the polynomial. A polynomial with two terms is a binomial. A polynomial with three terms is a trinomial.

<table>
<thead>
<tr>
<th>Term</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Binomial</td>
<td>$5x + 2$</td>
</tr>
<tr>
<td>Trinomial</td>
<td>$x^2 + 5x + 2$</td>
</tr>
</tbody>
</table>

The degree of a polynomial is the greatest degree of its terms. A polynomial in one variable is in standard form when the exponents of the terms decrease from left to right. When you write a polynomial in standard form, the coefficient of the first term is the leading coefficient.

<table>
<thead>
<tr>
<th>Leading</th>
<th>Degree</th>
<th>Constant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>2x³ + x² - 5x + 12</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Monomial</th>
<th>Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>3x</td>
<td>1</td>
</tr>
<tr>
<td>$\frac{1}{2}ab^2$</td>
<td>3</td>
</tr>
<tr>
<td>$-1.8m^5$</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Not a monomial</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>$5 + x$</td>
<td>A sum is not a monomial.</td>
</tr>
<tr>
<td>$\frac{2}{n}$</td>
<td>A monomial cannot have a variable in the denominator.</td>
</tr>
<tr>
<td>$4^a$</td>
<td>A monomial cannot have a variable exponent.</td>
</tr>
<tr>
<td>$x^{-1}$</td>
<td>The variable must have a whole number exponent.</td>
</tr>
</tbody>
</table>

Fill in your handout.
Add Polynomials

How could I add the following two Polynomials? \((2x^3 - 5x^2 + x) + (2x^2 + x^3 - 1)\)

*Vertical Method:*

\[
\begin{array}{c|c|c|c|c}
\text{Term} & x^3 & x^2 & x^1 & x^0 \\
\hline
2x^3 & -5x^2 & +x & & \\
+ & x^3 & & & \\
\hline
3x^3 & -3x^2 & +x & -1 & \\
\end{array}
\]

*Horizontal Method:*

\[
(2x^3 - 5x^2 + x) + (2x^2 + x^3 - 1)
\]

Which method do you prefer? _______________________________________________________________________

Add the following polynomials. Make sure your final answer is in standard form.

1. \((x^3 + 2x - 1) + (2x^2 - 2x + 1)\)  
   \[
   3x^2
   \]

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

3. \((-4x^3 + 9) + (6x^3 - 14)\)  

4. \((-3a^2 - 2) + (7a + 5)\)

5. \((x^2 + 3x + 5) + (-x^2 + 6x - 4)\)  

6. \((t^2 + 3t^3 - 3) + (2t^2 + 7t - 2t^3)\)
**Practice/Homework Time**

<table>
<thead>
<tr>
<th>Polynomial</th>
<th>Write in Standard Form</th>
<th>Identify Degree and Leading coefficient</th>
<th>Classify polynomial by number of terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. $6c^2 + 2c^4 - c$</td>
<td>$2c^4 + 6c^2 - c$</td>
<td>D: 4, l.c.: 2</td>
<td>T</td>
</tr>
<tr>
<td>2. $4w^{11} - w^{12}$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. $7 + 3p^2$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. $8d - 2 - 4d^3$</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## 7.1 Day 1 Add Polynomials Notes

### Adding Polynomials

#### Find the sum of the Polynomials

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>$3t^8$</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>$5z + 2z^3 + 3z^4$</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>$8y^6 - 7 + 8y^4$</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>$6x^2 - 3x^7$</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>$-4p^6 + 9 - 3p^2$</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>$7y$</td>
<td></td>
</tr>
</tbody>
</table>

1. $(5x^2 + 2x + 3) + (x^2 - x + 1)$

2. $(-3x^2 + 4x - 3) + (-8x + 9)$

3. $(s^3 + 2s + 1) + (s^2 + 2s)$

4. $(5a^3 - a^2 + 9) + (3a^2 - 2a + 1)$
5. \((a^4 + 2a^2 + 4) + (a^3 - 5a^2)\)

6. \((-u^2 + 9u + 3) + (u^3 - 1)\)

7. \((-10u^2 + 2u - 3) + (u^2 + 3u + 1)\)

8. \((81y^3 + 9y + 27) + (3y^2 - 9)\)

9. \((7a^2 + 3a - 2) + (-10a^2 + 2a)\)

10. \((21b^3 + 4b + 3) + (2b^2 - 11)\)

11. The cost of making pork tamales can be represented by \(18 + 6x\) where \(x\) represents the number of batches of tamales made. The cost of making green chili tamales can be represented by \(9x + 20\) where \(x\) represents the number of batches of tamales made. Write a polynomial that represent how much it would cost to make \(x\) amount of batches of pork and chili tamales.
1. Consider the polynomial \(-8 - x^2 + 2x\):
   a. Write the polynomial in standard form:
   
   b. Identify the degree of the polynomial:
   
   c. What is the leading coefficient:
   
   d. Classify the polynomial by the number of terms:

2. Find the sum of the polynomials:
   a. \((6n^2 + 2n + 3) + (-5n^2 - 4n - 7)\)

   b. \((5x^2 - 4x + 7) + (3x^2 - 5)\)