Accelerated 65 - 95, HW 10 (B 5.1) Adding Polynomials

Name: _____

Concept and Vocabulary Check:

1. A polynomial is a single term or the sum of two or more terms containing variables with exponents that are _____ numbers.

2. It is customary to write the terms of a polynomial in the order of descending powers of the variable. This is called the _____ form of a polynomial.

3. A simplified polynomial that has exactly one term is called a/an _____.

4. A simplified polynomial that has exactly two terms is called a/an _____.

5. A simplified polynomial that has three terms is called a/an _____.

6. The degree of ax^n is _____, provided that $a \neq 0$.

7. The degree of a polynomial is the _____ degree of all the terms of the polynomial.

8. Polynomials are added by combining _____ terms.

Practice Exercises:

In exercises 1 - 15, identify each polynomial as a monomial, a binomial, or a trinomial. Give the degree of the polynomial.

1. $3x + 7$

3. $x^3 - 2x$

5. $8x^2$

7. 5

9. $x^2 - 3x + 4$

11. $7y^2 - 9y^4 + 5$

13. $15x - 7x^3$

15. $-9y^{23}$

In exercises 17 - 85, add or subtract the polynomials as indicated.

17. $(9x + 8) + (-17x + 5)$

29. $(4y^2 + 8y + 11) + (-2y^3 + 5y + 2)$

21. $(7x^2 - 11x) + (3x^2 - x)$

33. $\left(9x^3 - x^2 - x - \frac{1}{3}\right) + \left(x^3 + x^2 + x + \frac{4}{3}\right)$

23. $(4x^2 - 6x + 12) + (x^2 + 3x + 1)$

37. $(0.03x^5 - 0.1x^3 + x + 0.03) + (-0.02x^5 + x^4 - 0.7x + 0.3)$

41.
$$\begin{array}{r} 3x^2 - 7x + 4 \\ -5x^2 + 6x - 3 \\ \hline \end{array}$$

49.
$$\begin{array}{r} 7x^4 - 3x^3 + x^2 \\ x^3 - x^2 + 4x - 2 \\ \hline \end{array}$$

45.
$$\begin{array}{r} y^3 + 5y^2 - 7y - 3 \\ -2y^3 + 3y^2 + 4y - 11 \\ \hline \end{array}$$

51.
$$\begin{array}{r} 7x^2 - 9x + 3 \\ 4x^2 + 11x - 2 \\ -3x^2 + 5x - 6 \\ \hline \end{array}$$

53.
$$\begin{array}{r} 1.2x^3 - 3x^2 + 9.1 \\ 7.8x^3 - 3.1x^2 + 8 \\ \underline{1.2x^2 - 6} \end{array}$$

57. $(x^2 - 5x - 3) - (6x^2 + 4x + 9)$

73. $\left(\frac{3}{7}x^3 - \frac{1}{5}x - \frac{1}{3}\right) - \left(-\frac{2}{7}x^3 + \frac{1}{4}x - \frac{1}{3}\right)$

75.
$$\begin{array}{r} 7x + 1 \\ \underline{-(3x - 5)} \end{array}$$

79.
$$\begin{array}{r} 7y^2 - 5y + 2 \\ \underline{-(11y^2 + 2y - 3)} \end{array}$$

61. $(x^2 - 8x - 9) - (5x^2 - 4x - 3)$

65. $(6y^3 + 2y^2 - y - 11) - (y^2 - 8y + 9)$

69. $(y^6 - y^3) - (y^2 - y)$

81.
$$\begin{array}{r} 7x^3 + 5x^2 - 3 \\ \underline{-(-2x^3 - 6x^2 + 5)} \end{array}$$

85.
$$\begin{array}{r} 7x^4 - 3x^3 + 2x^2 \\ \underline{-(-x^3 - x^2 + x - 2)} \end{array}$$

Applications:

103. As you complete more years of education, you can count on a greater income. The bar graph on page 356, shows the median, or middle-most, annual income for Americans, by level of education, for a recent year.

Here are polynomial models that describe the median annual income for men, M, and for women, W, who have completed x years of education.

$$M = -18x^3 + 923x^2 - 9603x + 48,446$$
$$W = 17x^3 - 450x^2 + 6392x - 14,764$$

a. Use the equations above to find a mathematical model for $M - W$.

b. According to the model in part (a), what is the difference in the median annual income between men and women with 14 years of education?

c. According to the data displayed by the graph on page 348, what is the actual difference in the median annual income between men and women with 14 years of education? Did the model in part (b) underestimate or overestimate this difference? By how much?

Critical Thinking:

115. Determine whether the following statement "makes sense" or not and explain your reasoning:

By looking at the first terms of a polynomial, I can determine its degree.