Worksheet 1: **Assignment 1** : Algebra : Simplifying by collecting the like terms.

Do Assignment 1 in a book (soft cover): Due date : to be confirmed.

1. Simplify the following into the simplest form.

*Let's do part **a**. as an example*

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

$= x^2 + 3x + 2 + 2x^2 + 5x + 1$

$= x^2 + 2x^2 + 3x + 5x + 2 + 1$

$= 3x^2 + 8x + 3$

a $(x^2 + 3x + 2) + (2x^2 + 5x + 1)$

b $(x^3 + 4x^2 + x - 6) + (x^2 - 3x + 7)$

c $(4 - x + 2x^3) + (3 - x + 6x^2 - 5x^3)$

d $(x^5 + 8x^3 - 5x^2 - 9) + (-x^4 - 4x + 1)$

e $(3x^3 - 7x^2 + 2) - (x^3 + 2x^2 + x - 6)$

f $(x^5 + 3x^4 - x^2 - 3) - (x^4 + 2x^3 - 3x + 2)$

g $(2x^7 - 9x^5 + x^3 + x) - (3x^6 - 4x^3 + x + 5)$

h $2(x^4 + 4x^2 - 3) + (x^4 + 3x^3 - 8)$

i $3(7 + 4x - x^2 - 2x^3) + 5(-2 - 3x + x^3)$

j $6(x^3 + 5x^2 - 2) - 3(2x^3 - x^2 - x)$

k $8(x^4 + 2x^2 - 4x - 1) - 2(5 - 3x + x^3)$

l $7(x^6 + 3x^3 + x^2 - 4) - 4(2x^6 + x^5 - 3x - 7)$

2 Simplify

a $(3y^2 + 2y + 1) + (y^3 - 4y^2 + 7y) + (2y^3 - y^2 - 8y + 5)$

b $3(t^4 - t^3 + 4t) + (6 - t - 3t^3) + 2(t^4 - 2t^2 + 4)$

c $(x^3 - 6x^2 + 8) + (5x^2 - x + 1) - (2x^3 + 3x^2 + x - 7)$

d $2(3 + m + 7m^2 - 3m^5) + 6(1 - m^2 + 2m^4) - 5(m^5 + 3m^3 - m^2 + 2)$

e $\frac{1}{3}(1 - 2u + \frac{3}{5}u^2 + 3u^4) - \frac{1}{2}(2 - u + \frac{2}{3}u^2 - \frac{1}{2}u^3)$

3 Giving your answers in ascending powers of x, simplify

a $x(2 - 3x + x^2) + 4(1 + 2x^2 - x^3)$

b $x(x^4 + 7x^2 - 5x + 9) - 2(x^4 - 4x^3 - 3)$

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

d $x^2(8 + 2x + x^2) - 3(5 + 4x^2 + x^3)$

e $3x^2(x + 3) - x(x^3 + 4x^2) + 5(x^3 - 2x)$

f $x^2(6 - x + 5x^2) + 7x(2 - x^3) + 4(1 - 3x - x^2)$

Let's do **3.a.** as an example

a. $x(2 - 3x + x^2) + 4(1 + 2x^2 - x^3)$

$= 2x - 3x^2 + x^3) + 4 + 8x^2 - 4x^3$

$= 4 + 2x - 3x^2 + 8x^2 + x^3 - 4x^3$

$= 4 + 2x + 5x^2 - 3x^3$

4. Expand and Simplify

a. $2x(x - 7)$ c. $3(x - 2)(x - 1)$ e. $(1 - 3x)(1 + 3x)$

b. $-(2 - x)$ d. $(3 - 4x)^2$ f. $(2x + 5)(3x + 1)$