**Ag Bus 313**

**Problem Set 1**

**200 Points**

**Tentative Due Date: 5:00 pm on 1/23/20**

**Dr. Hurley**

**Directions:** Please answer all items on this homework. You must show all your work. Unless otherwise stated, please simplify your answer.

1. Please expand the following problems: **(10 Points)**
   1. (x + y)(z + x)(y + z)
   2. (r + s + t)2
   3. (a + b)4
   4. (c + d)4(c + d)-2
   5. (2u + v)3
2. Please simplify the following: **(5 Points)**
   1. y = f(x) = x-2x8x16x-10x-12
   2. y = f(x) = (x-5x6)/(x9x-3x-8)
   3. y = f(x) = x-5/4x9/4
   4. y = f(x) = (x7)-2/7
   5. y = f(x) = (x1/4)4/3
3. Solve x2 as a function of x1: **(20 Points)**
   1. x11/3 x22/3 = 9
   2. x1-1/4 x23/4 = x13/4 x2-1/4
   3. 2x14/5x21/5 = 6
   4. x11/2x21/4 = 5
4. Solve the following for Y2 as a function of Y1: **(20 Points)**
   1. 
   2. 
   3. 
   4. 
5. Find the horizontal and vertical intercepts of the following: **(10 Points)**
   1. y = f(x) = 8x + 24
   2. y = f(x) = x2 – 4x – 21
6. Using the three equations, get Y2 as a function of Y1 (Please do not represent your answer in decimals.): **(20 Points)**
   1. Y1 = 6x13/4

Y2 = 30x23/4

x1 + x2 = 51,250

* 1. Y1 = 360x11/4

Y2 = 90x21/4

x1 + x2 = 10,625

1. Find the inverse of the following functions: **(20 Points)**
   1. y = f(x) = 5x + 15
   2. y = f(x) = 4x2 + 8x + 20
2. Solve for Y1: **(30 Points)**
   1. 
   2. 
   3. 
   4. 
   5. 
3. Find the intersection point(s) of the two functions: **(15 Points)**
   1. y = f(x) = 5x + 10 and y = g(x) = -2x + 3
   2. y = f(x) = 59 – 5x and y = g(x) = 10 + 2x
   3. y = f(x) = 2x2 and y = g(x) = 8x + 42
4. Using limits, find the general slope of the following: **(20 Points)**
   1. y = f(x) = -17x + 22
   2. y = f(x) = 30x2 + 140x + 425
   3. y = f(x1, x2) = 5x12 + 6x1x2 + 7x22 + 95 (For this problem, you need to apply the limit formula for x1 and also for x2.)
5. Please find the derivative of the following functions: **(14 Points)**
   1. y = f(x) = -17x + 22
   2. y = f(x) = 30x2 + 140x + 42
   3. y = f(x) = 12x3 + 10x2 + 8x + 6
   4. y = f(x) = x3 + 3x2 + 4x1/4 + 25
   5. y = f(x) = (x2+x+1)(4x2 + 3x + 2) (Use the Product Rule)
   6. y= f(x) = (2x2 + 4x + 2)/ (2x + 2) (Use the Quotient Rule)
   7. y= f(x) = (4x2 + 3x + 2)-4 (Use either Generalized Power Rule or the Chain Rule)
6. Take the derivative with respect to both x1 and x2: **(16 Points)**
   1. y = f(x1, x2) = 10x1 + 9x1x2 + 8x2 + 23
   2. y = f(x1,x2) = 15x11/5x22/5
   3. y = f(x1, x2) = 5x12 + 6x1x2 + 7x22 + 95
   4. y = f(x1,x2) = x13 + 3x12x2 + 4x1x21/4 + 17