**College Algebra & Trigonometry**

**Fall 2018 Essay Final**

**Ms. Wiggins**

**Directions: Write an 3-5 paragraph essay responding to the writing prompt below. The answer must be written in essay format and all questions within the writing prompt must have a written response to receive credit. Each question addressed within the prompt is worth a maximum of 4 points each for a total of 32 points and is worth 50% of your final exam** **grade.**

**Writing Prompt:** You just graduated high school and you need to find a job that will cover your monthly expenses so you can move into your own place. Your monthly expenses are $1200, which includes rent, utilities, transportation and food. Create a function that will represent how many hours you work as function of much money you will make and express the function in your own words (NO NUMBERS) and explain how much per hour you need to make at minimum. **(Assuming you work 40 hours per week)** If you make $10 an hour plus $30 added per check to cover traveling expenses, would that be enough to afford your monthly expenses? Explain. If you make $15 an hour minus $100 being deducted per month for your retirement fund, would that be enough to afford your monthly expenses? Explain. Would you gross more money per month making $10 an hour or $15 per hour? Explain. Explain in words how you would graph both functions *f(x)* = 10x + 30 and *h(x)* = 15x – 100. Are the functions *f* and *h* parallel, perpendicular (If so, name the point of intersect) or neither? What are the x- and y-intercepts of each function. What is *f(h(x)) and h*(*f*(x)) if x = 7?

**Solution:**

**The function that will represent my hours worked as a function of the money I will earn will be *f* of *x* is the product of my hourly wage and one-hundred and sixty hours. If I need to make at least twelve hundred dollars a month to cover expenses then I will have to make a minimum of seven and a half dollars per hour.**

**If I make ten dollars an hour, then my monthly wage would be one-thousand and thirty dollars. I will have four hundred and thirty dollars a month left over to buy other needed items and live. I would still need more money per month because I didn’t take into consideration that taxes will come out of my check as well.**

**If I make fifteen dollars an hour then my month wages will be two-thousand and three-hundred dollars. I will have one-thousand and one-hundred dollars left over to buy other needed items and live. After taxes come out I still will have enough money to cover all my expenses and needs if I budget correctly. I would definitely make more money at fifteen dollars per hour with a one-hundred-dollar deduction.**

**To graph the function *f* I would first plot the point (0, 30) and then rise ten units up the y-axis and over one unit to the right along the x-axis to plot the second point (1, 40), then draw a line through both points. To graph the function *h* I would plot the point (0, -100) and then rise up the y-axis fifth teen units and run one unit to the right to plot the second point (1, -85), then draw a line through both points.**

**The functions intersect at the point (26, 290), but are not perpendicular because the intersection does not form a ninety-degree angle. The y-intercept is thirty which crosses the y-axis at the point (0, 30) and the x-intercept is negative three which crosses the x-axis at the point (-3, 0). If x = 7, then *f(h(x))* is eighty and *h(f(x))* is fourteen-hundred.**