

Unit 1: Functions and Graphs
Homework Packet #1 – Due 9/25/15

Use the table of data below to answer questions #1-8.

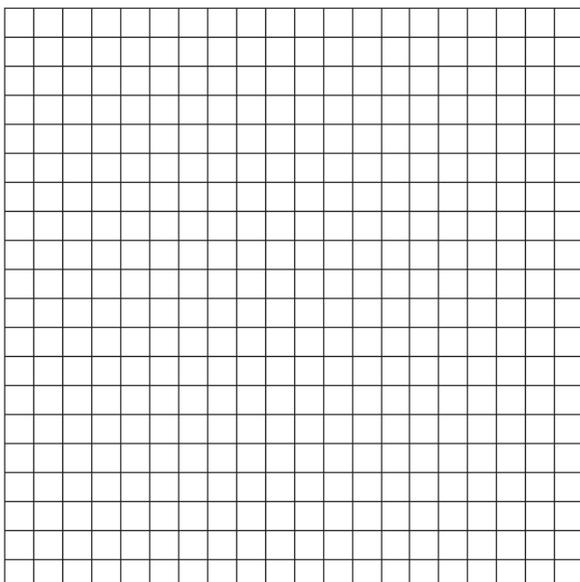
Employment Statistics – Percentage of the male and female populations employed in the civilian workforce during selected years

Year	Female	Male
1954	32.3	83.5
1959	35.1	82.3
1964	36.9	80.9
1969	41.1	81.1
1974	42.8	77.9
1979	47.7	76.5
1984	50.1	73.2
1989	54.9	74.5
1994	56.2	72.6
1999	58.5	74.0
2004	57.4	71.9

- 1.) (a) According to the numerical model, what has been the trend in females joining the workforce since 1954?
(b) In what 5-year interval did the percentage of women who were employed change the most?

- 2.) (a) According to the numerical model, what has been the trend in males joining the workforce since 1954?
(b) In what 5-year interval did the percentage of men who were employed change the most?

- 3.) Model the data with two scatter plots on the same graph, one showing the percentage of women employed as a function of time and the other showing the same for men. Measure time in years since 1954.



- 4.) Are the male percentages falling faster than the female percentages, or vice versa?
- 5.) Model the data algebraically with linear equations in the form of $y = mx + b$. Write one equation for the women's data and another equation for the men's data. Use the 1954 and 1999 ordered pairs to compute the slopes.
- 6.) If the percentages continue to follow the linear models you found in question 5, what will the employment percentages for women and men be in the year 2009?
- 7.) If the percentages continue to follow the linear models you found in question 5, when will the percentages of women and men in the workforce be the same? What will that percentage be?
- 8.) Explain why the percentages cannot continue indefinitely to follow the linear models you wrote in question 5.
- 9.) A bakery sells a 9" by 13" cake for the same price as an 8" diameter round cake. If the round cake is twice the height of the rectangular cake, which option gives the most cake for the money?
- 10.) At the Oshkosh, Wisconsin, air show, a pilot drops a smoke bomb to signal the official beginning of the show. Ignoring air resistance, an object in free fall will fall d feet in t seconds, where d and t are related by the algebraic model $d = 16t^2$.
- (a) How long will it take the bomb to fall 180 feet?
- (b) If the smoke bomb is in free fall for 12.5 seconds after it is dropped, how high was the airplane when the smoke bomb was dropped?

$$11.) v^2 - 5 = 8 - 2v^2$$

$$12.) 2x^2 - 5x + 2 = (x - 3)(x - 2) + 3x$$

$$13.) x^2 - 7x - \frac{3}{4} = 0$$

$$14.) x + 1 - 2\sqrt{x + 4} = 0$$

15.) Swan Auto Rental charges \$32 per day, plus \$0.18 per mile for a car rental.

(a) Elaine rented a car for one day and drove 83 miles. How much did she pay?

(b) Ramon paid \$69.80 to rent a car for one day. How far did he drive?

BONUS:

16.) Prove that if n is a positive integer, then $n^2 + 2n$ is either odd or a multiple of 4.