Groupwork IA 1.3

Name: **Group #:**

1) For each of the following systems of linear equations in two variables, solve it algebraically by using substitution and then verify your solution by graphing the two equations in desmos.com.

a) $\begin{cases} y = -2x + 15 \\ y = 7x - 3 \end{cases}$

b) $\begin{cases} y = 3.5x - 0.5 \\ y = -1.4x + 4.4 \end{cases}$

2) Load "Data for IA Exercise 1.3.4: Percentages of Women/Men Who Are Married (by Year)" in StatCrunch (its probably sufficient to search "Data for IA Exercise 1.3" to find it).

a) Use stat → regression → simple linear twice to produce a linear system to model the percentages of women and men ($W(t)$ and $M(t)$, respectively) who are married, where t is the number of years since 1990. (Examine the lines in the respective scatterplots to verify that these equations produce a valid model. For each equation, round its slope and intercept to 2 decimal places.)

b) Use substitution to predict when the percentage of women who are married will equal the percentage of mean who are married.

c) What will this percentage be?

d) How confident are you in your answer for part (c)? Explain.

3) In 2017, the price of a 2016 Honda Accord was about $\$22,061$, with a depreciation of about $\$2607$ per year. A student had $\$1460$ in 2017 and saves $\$2300$ each year. Assume that the student does not earn interest on the savings.

a) Let $H(t)$ be the value of the 2016 Honda Accord (in dollars) and $S(t)$ be the student's total savings (in dollars), both at t years since 2017. Find the equations of H and S.

b) Use substitution to predict when the student will be able to buy a 2016 Honda Accord for cash.

c) Use desmos.com to verify your results in part (b).

d) Now assume the student does earn interest on the savings. Is your prediction in part (b) an underestimate or overestimate? Explain.