

YOUR NAME: _____

George Voutsadakis

Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. A friend of yours wants your help in resolving the following puzzle: Two numbers have sum 18. Moreover, if one adds $\frac{1}{4}$ to the first number and subtracts twice the second number from this sum, the result is 1.

- (a) Please, introduce carefully variables (clearly expressing their meaning) and write two equations that reflect the data provided in the statement of the puzzle.

- (b) Solve the equations that you wrote in (a) to find out which are the two mystery numbers.

2. In 1980 the population of Mexico was about 67.38 million. For the years 1980 through 1985, the population grew at a rate of about 2.6% per year.

- (a) Create a small table of 4 values for the population P versus time t .

- (b) Find a formula for P vs. t (an exponential function).

- (c) Using your previous answer, predict when the population of Mexico will reach 90 million. Please, explain your method.