

YOUR NAME: _____

George Voutsadakis

Read each problem **very carefully** before starting to solve it. Each problem is worth 10 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. A 10% chlorine solution is to be mixed with a 25% chlorine solution to get 60 gallons of a 20% chlorine solution. How many gallons of each should be mixed?
 - (a) Set variables and state their **precise** meaning.
 - (b) Write equation(s) reflecting the data.
 - (c) Solve the equation(s) to answer the question posed.

2. Solve the following system using elimination:

$$\left\{ \begin{array}{rcl} x + y - z & = & -8 \\ x - y + 2z & = & 9 \\ 2x + y - z & = & -9 \end{array} \right\}$$

3. Simplify the following expressions and write your answers without negative powers:

(a) $\frac{3xy^3}{(2x^{-2}y)^{-3}} =$

(b) $\left(\frac{6a^{-2}b^3}{2x^4}\right)^{-2} (3a^{-1}b^2)^3 =$

4. Factor each polynomial completely:

(a) $3x^4 - 75x^2 =$

(b) $4xy^2 - 12xy + 9x =$

(c) $2(x+2)^2 + 5(x+2) - 3 =$

(d) $x^2 - 3y - 3x + xy =$

5. Solve the following polynomial equation:

$$(x - 6)(x + 1) = 18.$$

(**Hint:** You must use the **zero-factor property**!)