Meramec College Algebra Quiz 3 Solution Summer 2008

NAME: _____Score_____/10

Please **print** your name

SHOW ALL YOUR WORK IN A NEAT AND ORGANIZED FASHION

On this quiz I will lead you through a proper way of writing a solution to a question. You are to supply the details by filling in each blank. **No computations are required or even desired.**

Problem: What quantity of a 60% acid solution must be mixed with a 30% acid solution to produce 300 mL of a 50% acid solution ?

(*) and (**) should not be the same.

Analysis:

Let x be the amount (measured in milliliters) of **60% solution** to be added.

The volume of the final mixture will be **300** mL.

The amount of acid in the final solution is **(0.5)(300)**. (*)

The amount of acid contributed by the 60% solution is **(0.6)x**.

The amount of the 30% solution will be **300 - x** mL.

The amount of **acid** contributed by the 30% solution is (0.3)(300 – x).

The amount of acid in the final solution is **(0.6)x + (0.3)(300 – x)**. (**)

We now have the amount of **acid** in the **final** solution written in two ways.

Therefore the mathematical model for this concentration problem is the linear equation in one variable

(Insert the Model/equation here) (0.6)x + (0.3)(300 – x) = (0.5)(300)

Solution: (I have solved the equation so you don't need to)

Ordinary methods now may be used to solve this equation to obtain x = 200.

Conclusion: (Must be based on the correct solution as stated above.)

200 milliliters of **60% solution** must be added to 100 milliliters of **30% solution** to obtain

300 milliliters of **50% solution**.