Math

More help on calorimetry problems

You need to think through what the problem is telling you. Remember, you have three heats:

$q_{calorimeter}$
q_{water}
q_{metal}

Each one of these q's is determined by the equation

$q = (m) \times (c) \times (\Delta T)$

When you are given the mass of the calorimeter, that's the "m" in the equation for $q_{calorimeter}$. When you are given the mass of the water, that's the "m" in the equation for q_{water}. When you are given the mass of the metal, that's the "m" in the equation for q_{metal}.

Also, as explained in the book, the temperatures of the water and calorimeter are the same throughout the experiment. Thus, the final temperature of the water minus the initial temperature of the water is the ΔT in the equations for both $q_{calorimeter}$ and q_{water}. In addition, as explained in the book, the final temperature of the metal is also the same as the final temperature of the water and calorimeter. Thus, the initial temperature of the metal minus the final temperature of the water is the ΔT in the equation for q_{metal}.

There will always be two q's for which you have enough information to get numbers. There will be one q where you are missing information, but you can figure that out using the calorimetry equation:

$-q_{metal} = q_{water} + q_{calorimeter}$

Solving for the q you do not know will then allow you to use that q's equation to solve for the unknown in the problem.

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