10. [10 points] When not selling cards, Rowena runs a rather popular ice cream shop in town. Her store carries only two flavors, mango and strawberry, which she sells for $M(k)$ and $S(k)$ dollars, respectively, for k kilograms. Assume that both functions are invertible, but **do not** assume anything else about them. Your answers for this problem may involve M, S, or their inverses.

a. [2 points]
Give a practical interpretation of $S^{-1}(4.7)$.

Solution: $S^{-1}(4.7)$ is the amount of kilograms of strawberry ice cream that costs 4.7 dollars.

b. [3 points]
Give a practical interpretation of $M^{-1}(S(1.5)) = 1$.

Solution: One kg of mango ice cream is the same price as 1.5 kg of strawberry ice cream.

c. [2 points]
Write an equation that expresses the following: "7 kg of strawberry ice cream costs 4 dollars less than 5 kg of mango ice cream."

Solution: $S(7) + 4 = M(5)$

d. [3 points]
A customer bought T total kg of ice cream at Rowena's shop. If they spent \$20 on strawberry ice cream, find an expression for the amount, in dollars, they spent on mango ice cream. Your answer may involve T.

Solution: $M(T - S^{-1}(20))$

