

7. [10 points] Rachel is Phoebe's secret snowflake this year, so she decided to make a guitar for her. Rachel needs to buy some wood and she has narrowed down her options to three: mahogany, walnut and cedar.

Let  $M(v)$ ,  $W(v)$  and  $C(v)$  be the costs, in dollars, for buying  $v$  kg of the mahogany, walnut and cedar wood, respectively.

In addition, assume that the functions  $M$ ,  $W$  and  $C$  are invertible.

- a. [3 points] Write a mathematical expression for the following:

The total cost, in **cents**, of buying 3 kg of cedar and 2.5 kg of walnut.

(Note: There are 100 cents in 1 dollar.)

*Solution:*  $100(C(3) + W(2.5))$

- b. [7 points] Write a practical interpretation of the following:

- i. [3 points]  $C^{-1}(20)$

*Solution:*  $C^{-1}(20)$  is the amount of of cedar, in kg, Rachel can buy with \$20.

- ii. [4 points]  $W(6) = M(4)$ .

*Solution:* The cost, in dollars, of buying 6 kg of walnut and 4 kg of mahogany is the same.