

7. [8 points] Consider the three functions described below.

- The local animal shelter has a number of dogs available that people can adopt for free. The weight of a dog at the animal shelter is a function of its length. Let  $f(L)$  be the weight, in pounds, of a dog at the animal shelter that is  $L$  inches long.
- There is also a dog washing service. The amount they charge to wash a dog is a function of the dog's weight. Let  $g(W)$  be the price, in dollars, they charge to wash a dog that weighs  $W$  pounds.
- The amount of food a dog eats is a function of the dog's weight. Let  $h(W)$  be the cost, in dollars, of a month's supply of food for a dog that weighs  $W$  pounds.

Assume that  $f$ ,  $g$ , and  $h$  are invertible functions. Fill in each blank below with an appropriate expression. The expression may involve one or more of the functions defined above.

**Example:** If you have a dog that weighs 29 pounds, it will cost      $h(29)$      dollars to buy a month's supply of food for your dog.

a. [2 points] You are considering adopting a dog that is 34 inches long. That dog weighs

     $f(34)$      pounds.

b. [2 points] You have a dog that weighs 25 pounds. If you get your dog washed, and then

buy a month's supply of food for it, you will spend a total of      $g(25) + h(25)$      dollars.

c. [2 points] For \$30, you can buy a month's supply of food for a dog that weighs

     $h^{-1}(30)$      pounds.

d. [2 points] If you adopt a dog that is 18 inches long and want to get it washed, it will cost

you      $g(f(18))$      dollars.