

6. [13 points] Let  $f(v)$  be the gas consumption (in liters/km) of a car going at velocity  $v$  (in km/hr). In other words,  $f(v)$  tells you how many liters of gas the car uses to go one kilometer, if it is going at velocity  $v$ . You are told that

$$f(90) = 0.08 \text{ and } f'(90) = 0.0008.$$

- a. [5 points] Let  $g(v)$  be the distance the same car goes on one liter of gas at velocity  $v$ . What is the relationship between  $f(v)$  and  $g(v)$ ? Find  $g(90)$  and  $g'(90)$ .

- b. [5 points] Let  $h(v)$  be the gas consumption in liters per hour. In other words,  $h(v)$  tells you how many liters of gas the car uses in one hour if the car is going at velocity  $v$ . What is the relationship between  $h(v)$  and  $f(v)$ ? Find  $h(90)$  and  $h'(90)$ .

- c. [3 points] How would you explain the practical meaning of  $g'(90)$  to a driver who knows no calculus?