Chapter 21 Question

Mr. Otto Carr, owner of Otto’s Autos, sells cars. Otto buys autos for $c each and has no other costs.

a. What is his total cost if he sells 10 cars?
b. What if he sells 20 cars?
c. Write down the equation for Otto’s total costs assuming he sells y cars:
d. What is Otto’s average cost function?
e. For every additional auto Otto sells, by how much do his costs increase?
f. Write down Otto’s marginal cost function:
g. Draw Otto’s average and marginal cost curves if c = 20.
h. Suppose Otto has to pay $b a year to produce obnoxious television commercials. Otto’s total cost curve is now $TC(y) = cy + b$, his average cost curve is now $AC(y) = c + b/y$, and his marginal cost curve is $MC(y) = \underline{\quad}$
i. If $b = 100$, draw Otto’s average cost curve

Otto’s brother, Dent Carr, is in the auto repair business. Dent recently had little else to do and decided to calculate his cost conditions. He found that the total cost of repairing $s$ cars is $TC(s) = 2s^2 + 10$. But Dent’s attention was diverted to other things.

j. Dent’s Total Variable Cost:
k. Total Fixed Cost:
l. Average Variable Cost:
m. Average Fixed Cost:
n. Average Total Cost:
o. Marginal Cost:

A third brother, Rex Carr, owns a junk yard. Rex can use one of two methods to destroy cars. The first involves purchasing a hydraulic car smasher that costs $200 a year to own and then spending $1 for every car smashed into oblivion; the second method involves purchasing a shovel that will last one year and costs $10 and paying the last Carr brother, Scoop, to bury the cars at a cost of $5 each.

p. Write down the total cost functions for the two methods, where $y$ is output per year:
q. What is the average cost function for the hydraulic method?
r. What is the marginal cost function for the hydraulic method?
s. What is the average cost function for the bury method?
t. What is the marginal cost function for the bury method?
u. Rex wrecks 40 cars per year, which method should he use?
v. If Rex wrecks 50 cars per year, which method should he use?
w. What is the smallest number of cars per year for which it would pay him to buy the hydraulic smasher?