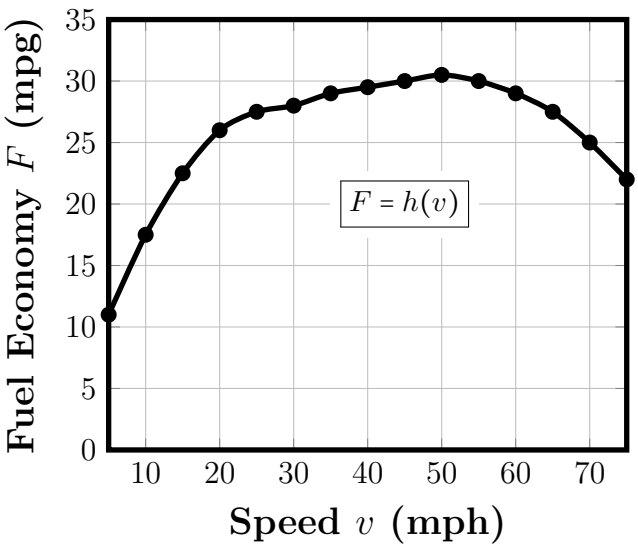
3. [8 points] The website `fueleconomy.gov` gives the graph on to the right to show fuel economy (in miles per gallon or mpg) as a function of speed (in miles per hour or mph) for a particular type of car. We'll call the function defined by this graph $h(v)$.



a. [1 point] What can you say about the concavity of $h(v)$ over the domain $[10, 30]$? *Circle one answer; no explanation necessary.*

CONCAVE UP

CONCAVE DOWN

NEITHER

b. [1 point] $h(v)$ is not an invertible function. Explain in 1–2 sentences how we know.

Explanation:

c. [1 point] If we wanted to restrict the domain of $h(v)$ so that is *was* an invertible function, what would be a good domain to use?

Domain:_____

Another function $c(F)$, which is invertible, gives the cost of gas in dollars per mile when we have a fuel economy of F mpg.

d. [4 points] Write a sentence or phrase that gives the meaning of each of the following equations or expressions. Or, if it does not make sense in context, explain why not.

i. $c(h(80)) = 0.22$

ii. $c^{-1}(0.18)$

e. [1 point] In this context, what is a reasonable domain for $c(F)$? *No explanation necessary.*

Domain: _____