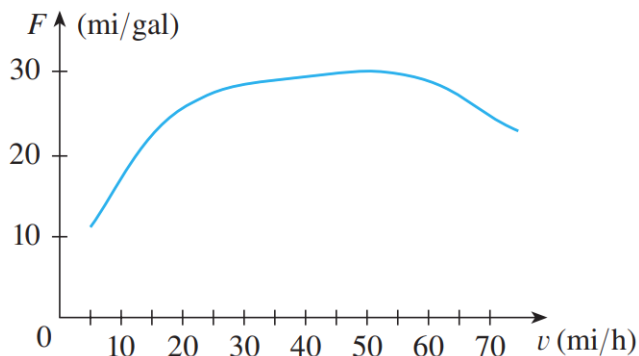# Exercise 14

The graph (from the US Department of Energy) shows how driving speed affects gas mileage. Fuel economy F is measured in miles per gallon and speed v is measured in miles per hour.

(a) What is the meaning of the derivative $F'(v)$?

(b) Sketch the graph of $F'(v)$.

(c) At what speed should you drive if you want to save on gas?

Solution

The value of F' is the slope of the tangent line to F at each value of v, and it represents the increase in miles per gallon by going a little bit faster.
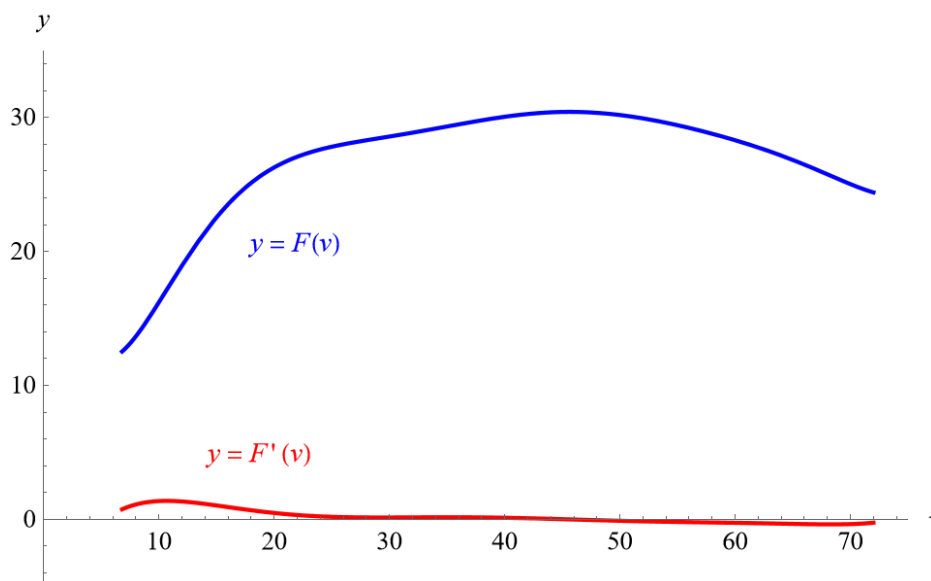
To save on gas, you should drive at speeds where the graph has the highest value, that is, at about 50 miles per hour.

Below is a better scaled graph of $F'(v)$ versus v.

$y = F'(v)$