Hybrid Car Payoff - Formula

You have been hired as a consultant to determine how cost effective hybrid cars are in the light of increasing gas prices.

1. Build a single formula showing the number of years it will take a hybrid car to pay for its extra, premium price over its regular (non-hybrid) counterpart (PAYBACK) as a function of
   - the price of the hybrid car (H-PRICE),
   - the MPG of the hybrid car (H-MPG),
   - the price of its regular (non-hybrid) counterpart (R-PRICE),
   - the MPG of its regular counterpart (R-MPG),
   - the average distance driven per year (DISTANCE),
   - the price of gas (GAS).

This will be in the form of an equation that has PAYBACK on the left side of the equal sign, and the other 6 variables listed above on the right side in the correct order/combination.

It is unlikely that you will build this formula in a single step. Most likely, you will break down the problem into a few smaller pieces, solve each piece, and then put all the pieces together. Hence, show all your steps (i.e. your thought process) in deriving this formula. Showing your steps is NOT a substitute for actually building/showing the formula.

Note: By "a hybrid car paying for itself" we mean a hybrid car generating enough savings in fuel expenses to recoup the extra price the customer has to pay over its non-hybrid counterpart. In a sense, it is analogous to a breakeven type of analysis.

2. After you have built the formula, use it to calculate the payback period, assuming:
   - the hybrid car costs $30,000, and goes 50 miles/gallon,
   - its regular (non-hybrid) counterpart costs $20,000, and goes 20 miles/gallon,
   - you drive 15,000 miles/year on the average,
   - the price of gas is $10/gallon.