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.