



Shell Around the Corner, Inc.

"It's a gas, man!"

2358 Transportation Drive
Tacoma, WA 98402

April 7, 2008

Independent Mathematical Contractors, Inc.
ADMC BB 106
Tacoma, WA 98402

Dear IMC:

With gasoline costs at an all time high, as an independently owned and operated service station, it is imperative that we better understand our business practices to minimize error and maximize profit. To that end, it has recently come to my attention that we may not be using the best technique for determining the amount of gasoline remaining in our storage tanks.

As you may know, gasoline is buried underground in cylindrical tanks lying on their sides. You may have seen one of my gas station attendants dropping a 16' measuring stick into the tank to measure the amount of gasoline remaining. Our tanks are 14' in diameter. In the past, if h ' of petroleum remained, we estimated the tank to be $h/14$ full. I seek your expert advice on the accuracy of our method. It is critical to determine the actual error of our method (as a function of height h). Additionally, please determine the particular height h for which the error is maximum. Finally, we would be most appreciative if you could create a scale model of a 16' measuring stick that directly and *accurately* reads the percentage full of our underground tank.

To assure your success in the completion of this project, we have secured expert, Dr. Jennifer Quinn. Feel free to contact her with any technical questions you might have in the course of your investigation. You should plan to see her by **April 18st** with an indication of your group members and preliminary work on the project.

I look forward to receiving your report, which should be typewritten and 3–5 pages in length. Equations explaining your solution should be included in the report, and it is permissible to hand-write these in blank lines between your typewritten explanation if this greatly facilitates the production of the report. You may to submit your report electronically, but pdf documents are strongly preferred. Please respond by midnight, **May 2**.

Sincerely,

E. Baron

Euler Baron
Owner & Operator
Shell Around the Corner