

### Dimensional Analysis Practice: One Last Hurrah

1. With a 3-day weekend coming up and the need for that fall festival type fun, you decide to head upstate to go apple-picking, pumpkin-picking, run through corn mazes, and all that other October jazz... You were soooooo... inspired (yes that is sarcasm) by your APES teacher (me ☺) and realized that this was your chance to use your newly- acquired dimensional analysis know-how. Before heading out on your trek, you calculated the cost of gasoline. Your car averages 20 miles/gallon of gas, and just yesterday you eye-balled a gas station selling gas at \$1.95/gallon! How much will it coast you in gas to complete this 420-mile journey?

2. Heating the House: Take 3?

Answer the questions below regarding the heating of a house in the Midwestern United States. Use the assumptions in the table below to perform the calculations that follow.

The house has 3000 square feet of living space.
60,000 BTUs of heat per square foot of living space is required to heat the house for the winter.
Natural gas is available at a cost of \$6.00 per 1000 cubic feet.
One cubic foot of natural gas supplies 1000 BTUs of heat energy
The furnace in the house is brand new and rated at 90% efficient.

- (a) Calculate number of cubic feet of natural gas required to heat the house for one winter. Show all the steps of your calculations, including units.

- (b) Calculate the cost of heating the house for one winter.

3. A unit of length called the “furlong” is used in horse racing. The units of length called the “chain” and the “link” are used in surveying. There are 8 furlongs in 1 mile (mi), 10 chains in 1 furlong, and 100 links in 1 chain. What is the length of 1 link in inches?