LAB 3 - REVIEW OF "GEOMATH"

1. Contour the map of elevations on page 23 of your lab manual. Use a 20' contour interval and start at 400'.

2. Answer questions 1-7 (except 5d and 6a) on page 41 of your lab manual.

3. Using the graph paper provided in your lab manual, complete question 1 on page 42 of your lab manual.

4. Convert the following chemical concentrations:

   - \(1\text{ part per million (1 ppm)} = \underline{\phantom{0}}\%\)
   - \(5,000\text{ parts per billion (5000 ppb)} = \underline{\phantom{0}}\text{ ppm}\)
   - \(5\% = \underline{\phantom{0}}\text{ ppm}\)
   - \(1\text{ milligram per litre} = \underline{\phantom{0}}\text{ ppm}\)

5. Suppose a metric ton (tonne) of gold ore has a gold grade (concentration) of 1 ppm. At a current market price of $1190/Troy ounce, how much is this tonne of ore worth?
   HINT: one Troy ounce = 31.1035 grams. HINT: 1 tonne = 1,000 kilograms

6. One barrel of oil (North Sea Brent) currently sells for $80.87. How much is one gallon of that crude oil worth?

7. Typical oil refinery operations produce 75 litres of gasoline from a single barrel of crude oil. Using the crude oil price in #6, what is the basic (not counting refining and transportation costs) worth of a gallon of gasoline?

8. With the current process efficiency of 86%, 2.3 gallons of ethanol can be produced from one bushel of corn. The current market price for a bushel of corn is $4.01. How much is the basic cost of a gallon of ethanol? If you were to make 1 gallon of E85 (85% alcohol-15% gasoline) mix, what would its basic cost be based on the numbers you got in questions 7 and 8?