# 1 Cognitive reasoning in the chemical sciences 3.6

*No calculators please.*

1. The pyramid of Cheops is 450 feet tall. The new Las Vegas hotel *King Tut* will have exactly the same shape but will be 1800 feet tall. How much bigger is the hotel King Tut in volume than the pyramid of Cheops?

2. Statewide sales tax is 10%. The store at which you are shopping has a store-wide 25% off sale. Sales clerks are supposed to apply the 25% sale reduction followed by using the 10% sales tax. Your clerk makes the mistake of applying the sales tax first followed by taking off 25%. Has the sales clerk saved you money, cost you money, or is there no diffference in final cost?

3. There are cows and goats in a fenced-off pasture with one open gate. Cows spend one-third of their time eating from a fixed feeding trough and the rest of their time moving at 2 miles an hour. Goats spend two-thirds of their time at the feeding trough and the rest of their time moving at 3 miles an hour. Originally there is an equal number of cows and goats. What is the initial ratio of cows to goats leaving the pasture?