A company has two machines, A and B, which independently fill small bottles with a liquid. The volumes of liquid per bottle, in suitable units, filled by machines A and B are denoted by X and Y respectively. A scientist at the company takes a random sample of 40 bottles filled by machine A and a random sample of 50 bottles filled by machine B. The results are summarised as follows.

$$\Sigma x = 1120$$
 $\Sigma x^2 = 31400$ $\Sigma y = 1370$ $\Sigma y^2 = 37600$

The population means of the volumes of liquid in the bottles filled by machines A and B are denoted by μ_A and μ_B .

- (a) Test at the 2% significance level whether there is any difference between μ_A and μ_B . [8]
- (b) Find the set of values of α for which there would be evidence at the α % significance level that $\mu_A \mu_B$ is greater than 0.25. [4]