DEPARTMENT OF ECONOMICS AND RELATED STUDIES
Statistics I (ECO00012C)

Problem Set 3: Hypothesis Testing
For Discussion in Week 8 (Seminar 2)

1. The figures of a large corporation show that its salespeople deliver an average number of sales contacts per week of 15.The vice president in charge of sales claims that the salespeople are averaging more than 15 sales contacts per week. As a check on his claim, $n = 36$ salespeople are selected at random, and the number of contacts made by each is recorded for a single randomly selected week. The mean and variance of the 36 measurements were 17 and 9, respectively. Does the evidence contradict the vice president's claim? Use a test with level $\alpha = 0.05$.

2. A machine in a factory must be repaired if it produces more than 10% defectives among the large lot of items that it produces in a day. A random sample of 100 items from the day's production contains 15 defectives, and the supervisor says that the machine must be repaired. Does the sample evidence support his decision? Use a test with level 0.01.

3. A psychological study was conducted to compare the reaction times of men and women to a stimulus. Independent random samples of 50 men and 50 women were employed in the experiment. The results are shown in the table below

Men	Women
$n_1 = 50$	$n_2 = 50$
$\overline{x}_1 = 3.6$ seconds	$\overline{x}_2 = 3.8$ seconds
$s_1^2 = 0.18$	$s_2^2 = 0.14$

   where $\overline{x}_1$ and $\overline{x}_2$ are the sample means and s_1^2 and s_2^2 the sample variances. Do the data present sufficient evidence to suggest a difference between true mean reaction times for men and women? Use $\alpha = 0.05$.