

1.
 - a. In this context, statistically significant means the observed changes in productivity were too large to attribute to chance.
 - b. Microsoft should have randomly assigned half of their employees to work a four-day work week and the other half to work a regular five-day work week (control group) to better compare the productivity between the two groups for these employees. This would be challenging for Microsoft because it is not fair to have some employees working five days and some employees working four days when both groups are making the same portion of their salaries.
2.
 - a. In one simulated sample of 100 women, 61% correctly predicted their baby's sex by simply guessing.
 - b. $\frac{24}{200} = 12\%$
 - c. No. A sample where 56% or more correctly predict the sex of the baby by simply guessing could reasonably occur purely by chance ($12\% > 5\%$).
 - d. 59% or greater. The typical cut-off for being convinced is any probability below 5%. In this case, that would be fewer than 10 of the 200 trials in the simulation. This happens at 59% on the simulated percent of correct guesses.
 - e. We would be more convinced. As the sample size increases, the variability of the estimate decreases. This would make it less likely for the sample proportion to be 56% or greater by simply guessing.
3.
 - a. Completely randomized design
 - b. Explanatory – level of exposure to peanuts (weekly exposure or complete avoidance); Response – development of a peanut allergy (yes or no)
 - c. $17.3\% - 3.2\% = 14.1\%$
 - d. Yes, these results are too unlikely to have occurred by chance alone, so we have convincing evidence that the regular exposure to peanuts is the reason for the difference in percentage of children who developed a peanut allergy.
4.
 - a. The treatments are the four exercise programs: aerobic, resistance, combination, or none.
 - b. The group who did no exercise program serves as a control group. This is so the researchers have a baseline CVD risk profile to compare with the other groups who completed the various exercise programs.
 - c. The observed differences in CVD risk profile between the aerobic group and the control group and between the combination group and the control group were too large to attribute to chance alone.
 - d. The observed difference in CVD risk profile between the resistance group and the control group was not large enough to rule out chance alone as a possible explanation.
5. D
6. C