

Chapter 16 Examples

Ex 1: Many studies have been conducted to determine the concentration of carbon monoxide (CO) near freeways with various conditions of traffic flow in Los Angeles. The basic technique involves capturing air samples in special bags and then determining the CO concentrations in the bag samples by using a machine called a spectrophotometer. These machines are delicate and must be calibrated every day. This involves using the machine to measure the CO concentration in a manufactured gas sample, called span gas, where the CO concentration is precisely controlled at 70 ppm. If the machine reads close to 70 ppm on the span gas, it's ready for use; if not, it has to be adjusted. Repeated readings of the CO concentration in the span gas follow a Normal distribution. One day a technician makes six readings on span gas. The results are

72 79 65 84 67 77

- Give a 95% confidence interval for the CO concentration in the span gas.
- A co-worker claims the data show the machine is out of calibration. Is there evidence to support his or her claim?

Ex 2: In order to test the quality of two brands of tires, six cars were equipped with one tire of brand *A* and one tire of brand *B*. The position of each tire was determined with the aid of a random number table. The cars were driven for one month, and the amount of wear (in thousandths of an inch) was recorded (see table below). Assume the amount of wear in each brand of tire follows a Normal distribution.

Car	Brand A	Brand B
1	125	133
2	64	65
3	94	103
4	38	37
5	90	102
6	106	115

- Is there evidence that the tires differ with respect to the mean amount of wear?
- Give a 95% confidence interval for the difference in the mean amount of wear in the two brands of tires.