The mean life for a certain brand of light bulb is 1800 hours with a standard deviation of 150 hours.

1. Between what two values is the life of a bulb likely to lie ?

2. Of a sample of 1000 bulbs, how many can be expected to have lifetimes between these two values ?

3. What is the probability that a bulb will last longer than 2100 hours ?

On a sequence of test runs of the same distance, the petrol consumption for a new car is found to have a mean of 7.4L and a standard deviation of 0.2L.

4. Within what two amounts does the consumption very probably lie ?

5. For 40 test runs, how many would be expected to have a consumption of less than 7L ?

6. If a test run is chosen at random, what is the probability that the consumption will be more than 7L ?

The mean length of a leaf is 4.5cm with a standard deviation of 1.2cm.

7. What is the probability that a leaf, chosen at random, will measure more than 4.5cm ?

8. In a sample of 1500 leaves, how many would you expect to have a length less than 2.1cm ?

9. What percentage of leaves would you expect to measure between 3.3cm and 8.1cm ?

The arrival time of a train at a major station is based on a mean of 5 p.m. and a standard deviation of 2 minutes.

10. If Mary wants to be almost certain of being at a station when the train arrives at what time should she be there ?

11. The train is classified as late if it arrives after 5.04 p.m. What is the probability that a train will be late ?

12. What is the probability that the train will be late, but will arrive before 5.06p.m. ?

Rods produced by a machine have a mean length of 65mm and a standard deviation of 3mm.

13. Find acceptable limits of length if 2½ % are rejected for being oversize and 2½ % are rejected for being undersized.

14. Rejects cost the company 85 cents per rod in wastage. Calculate the cost in wastage in a batch of 1000 rods.

15. The machine is to be reset so that only ½ % will be rejected for being oversized and ½ % will be rejected for being undersized. If the mean remains the same, what will the new standard deviation be ?