# Section 1: Introduction to the normal distribution

## Exercise level 1

1. Assuming that the distribution of heights of girls at a particular age may be modelled by a Normal distribution with mean 144.0 cm and standard deviation 5.0 cm, find the probability that a girl selected at random is
   (i) under 150 cm
   (ii) over 146 cm
   (iii) at least 136 cm
   (iv) under 140 cm

2. The lengths of a machined component may be modelled by a Normal distribution with mean 12.7 cm and standard deviation 0.75 cm. Find
   (i) the proportion shorter than 12.0 cm
   (ii) the proportion within 0.4 cm of the mean
   (iii) the proportion between 12.5 cm and 13.5 cm.

3. The lifetime of an electrical component may be modelled by a Normal distribution with mean 2500 hours and variance 900 hour$^2$.
   (i) Find the probability that a component lasts
      (a) more than 2520 hours
      (b) less than 2470 hours
      (c) between 2488 and 2509 hours
   (ii) How long would you expect
      (a) 35% of the components to last
      (b) 50% of the components to last
      (c) 80% of the components to last.