6 A factory produces chocolate bars. The weights of the bars are normally distributed with mean 155 g and standard deviation 6 g. A random sample of 350 of these bars is chosen.

(a) How many of these 350 bars would you expect to weigh between 148 g and 160 g? [4]

A second factory also produces chocolate bars. The weights of these bars are normally distributed with mean μ g and standard deviation σ g. Tests show that 8% of the bars weigh more than 114.0 g and 20% weigh less than 99.5 g.

(b) Find the value of μ and the value of σ. [5]

3 The heights of the 124 Senior members of the Giraffes basketball club are normally distributed with mean 187.4 cm and standard deviation 6.4 cm.

(a) How many members of the club would you expect to have heights within 5 cm of the mean? [4]

The heights of the Junior members of the Giraffes club are normally distributed with mean 172.7 cm and standard deviation σ cm. 23% of these members have height less than 170.3 cm.

(b) Find the value of σ. [3]

6 For a randomly chosen person, their next birthday is equally likely to occur on any day of the week, independently of any other person's birthday.

(a) Find the probability that, out of 10 randomly chosen people, none of them will have their next birthday on a Saturday or Sunday. [1]

(b) Find the probability that, out of 10 randomly chosen people, fewer than 3 will have their next birthday on a Wednesday. [3]

(c) Use a suitable approximation to find the probability that, out of 392 randomly chosen people, more than 65 will have their next birthday on a Friday. [5]

1 The masses of the bags of rice made by a company are normally distributed with mean μ kg and standard deviation 0.14 kg. The probability that the mass of a randomly chosen bag of this rice is less than 1.48 kg is 0.22.

Find the value of μ. [3]