REVIEW SET 24A NON-CALCULATOR

1 The average height of 17 year old boys is normally distributed with mean 179 cm and standard deviation 8 cm. Calculate the percentage of 17 year old boys whose heights are:

a more than 195 cm **b** between 163 cm and 195 cm

c between 171 cm and 187 cm.

2 The contents of cans of a certain brand of soft drink are normally distributed with mean 377 mL and standard deviation 4.2 mL.

a Find the percentage of cans with contents:

i less than 368.6 mL **ii** between 372.8 mL and 389.6 mL.

b Find the probability that a randomly selected can contains between 377 mL and 381.2 mL.

3 The edible part of a batch of Coffin Bay oysters is normally distributed with mean 38.6 grams and standard deviation 6.3 grams.

Let the random variable X be the mass of a Coffin Bay oyster.

a Find a if $P(38.6 - a \leqslant X \leqslant 38.6 + a) = 0.6826$.

b Find b if $P(X \geqslant b) = 0.8413$.

4 The results of a test are normally distributed. Harri gained a z-score equal to -2.

a Interpret this z-score with regard to the mean and standard deviation of the test scores.

b What proportion of students obtained a better score than Harri?

c The mean test score was 151 and Harri's actual score was 117. Find the standard deviation of the test scores.

5 The continuous random variable Z is distributed such that $Z \sim N(0, 1)$.
Find the value of k if $P(-k \leqslant Z \leqslant k) = 0.95$.

6 The distance that a 15 year old boy can throw a tennis ball is normally distributed with mean 35 m and standard deviation 4 m.

The distance that a 10 year old boy can throw a tennis ball is normally distributed with mean 25 m and standard deviation 3 m.

Jarrod is 15 years old and can throw a tennis ball 41 m. How far does his 10 year old brother Paul need to throw a tennis ball to perform as well as Jarrod?

7 State the probability that a randomly selected, normally distributed value lies between:

a σ above the mean and 2σ above the mean

b the mean and σ above the mean.

8

A bottle shop sells on average 2500 bottles per day with a standard deviation of 300 bottles. Assuming that the number of bottles sold per day is normally distributed, calculate the percentage of days when:

a less than 1900 bottles are sold

b more than 2200 bottles are sold

c between 2200 and 3100 bottles are sold.