6. Local runners take part in a 5 km race around a park. The finishing times for adult males, M minutes, and the finishing times for adult females, F minutes, are such that

$$M \sim \mathrm{N}(24, 9) \text{ and } F \sim \mathrm{N}(29, 14)$$

An adult male runner and an adult female runner are chosen at random.

Using standardisation,

(a) find the probability that the finishing time for the adult male runner is more than 2 minutes faster than the finishing time for the adult female runner.

(5)

Two adult male runners are selected at random.

Using standardisation,

(b) find the probability that their finishing times differ by more than one minute.

(6)

Two adult female runners and one adult male runner are selected at random.

Using standardisation,

(c) find the probability that the total finishing time of the two adult female runners is more than double the finishing time of the adult male runner.

(5)

(Total for Question 6 is 16 marks)