7. The time taken, X minutes, to complete an olympic triathlon is modelled by a normal distribution with mean 180 minutes and standard deviation 20 minutes.

(a) Using standardisation, show that the proportion of competitors that take longer than 210 minutes to complete an olympic triathlon is 6.68% according to the model.

(2)

Russell is preparing for an olympic triathlon. Russell aims to finish in the first 15% of all competitors.

(b) Using standardisation, estimate the longest time that Russell can take to complete the triathlon and achieve his aim, according to the model.

(3)

The time taken, Y minutes, to complete a sprint triathlon is modelled by a normal distribution with mean μ minutes and standard deviation σ minutes.

Given that $P(Y < \mu + 5) = 0.7967$

(c) (i) find $P(Y < \mu - 5 \mid Y < \mu)$

(2)

(ii) Show that, to the nearest whole number, $\sigma = 6$

(2)

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Question 7 continued

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TOTAL FOR PAPER IS 75 MARKS

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