7 At a particular supermarket, the times taken to serve each customer in a queue at a standard checkout may be modelled by a normal distribution with mean 240 seconds and standard deviation 20 seconds.

There is a queue of 3 customers at a standard checkout.

Making a reasonable assumption about the times taken to serve these customers,

(a) find the probability that the total time taken to serve the 3 customers will be less than 11 minutes.

(3)

(b) State the assumption you have made in part (a)

(1)

In the supermarket there is also an express checkout, which is reserved for customers buying 10 or fewer items. The time taken to serve a customer at this express checkout may be modelled by a normal distribution with mean 100 seconds and standard deviation 8 seconds.

On a particular day Jiang has 8 items to pay for and has to choose whether to join a queue of 3 customers waiting at a standard checkout or a queue of 7 customers waiting at the express checkout.

Using a similar assumption to that made in part (a),

(c) find the probability that the total time taken to serve the 3 customers at the standard checkout will exceed the total time taken to serve the 7 customers at the express checkout.

(4)

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Question 7 continued

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