5. The lengths, L mm, of housefly wings are normally distributed with $L \sim N(4.5, 0.4^2)$

(a) Find the probability that a randomly selected housefly has a wing length of less than 3.86 mm.

(3)

(b) Find

(i) the upper quartile (Q_3) of L

(ii) the lower quartile (Q_1) of L

(4)

A value that is greater than $Q_3 + 1.5 \times (Q_3 - Q_1)$ or smaller than $Q_1 - 1.5 \times (Q_3 - Q_1)$ is defined as an outlier.

(c) Find these two outlier limits.

(3)

A housefly is selected at random.

(d) Using standardisation, show that the probability that this housefly is **not** an outlier is 0.993 to 3 decimal places.

(3)

Given that this housefly is **not** an outlier,

(e) showing your working, find the probability that the wing length of this housefly is greater than 5 mm.

(4)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

Question 5 continued

Question 5 continued

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

Question 5 continued

(Total for Question 5 is 17 marks)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA